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Applying service design as an approach for finding way towards agile software development adoption

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Abstract

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In today's rapidly changing and competitive environment it has become necessary for companies to become more agile and respond to demands efficiently and effectively. By being agile organizations would be able to adapt to changes quickly, transform easily and lead into the competitive market. Hence more and more companies nowadays are trying to move from traditional software development methods to more innovative and agile software development methods. This thesis focuses on one of the multinational telecom company X and the unit Y within it, which is also willing to adapt to changing environments and innovative ways of working.

Unit Y is considering improving its current traditional software development method for change release process. Currently the ITIL process along with the waterfall model is followed for delivering changes, which is quite lengthy and time consuming and also presents additional challenges. After analyzing these challenges and drawbacks unit Y is willing to improve its service delivery to its internal customers. This thesis, therefore, focusses upon analyzing the differences between the waterfall model and the agile model, determining the better of the two, recommending a suitable agile method for unit Y and creating a plan of action required for the adoption of agile practices.

The theoretical framework of service dominant logic and value co-creation along with the service innovation approach is used to gain customer insights and conduct a detailed analysis. The iterative process of service design along with a number of tools and methods is used in the empirical part of the thesis. It is used to conduct the research activity in a systematic way and to visualize the end results with the help of a variety of tools.

The purpose of this thesis is to analyze how the adoption of new innovative software development methods can improve the existing change release service. The research started with a desktop research activity and based on the results of this activity, subject matter expert interviews were arranged along with an ethnographic interview with the internal customer. Popular media search was conducted in order to build a detailed understanding of the waterfall and agile software development methodologies. Based on this information, a stakeholder map was created to identify key participants of a co-creation workshop. A day long co-creation workshop was conducted with all the identified stakeholders and internal customers. Tools such as customer journey map, mind map and SWOT analysis were used in the workshop to identify challenges in the existing process, requirements and expectations from the service and to analyze customer mindset towards change. Based on the results of the exploration and creation stage of the service design process, a solution is prototyped using service blueprint. An implementation framework model is also provided for the transition. This thesis attempts to seek definitive answers that are set in the beginning of this thesis.

Keywords: Agile, value co-creation, service design

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1 Introduction

1.1 Background

Welcome to the 21st century where change is the only constant. The world today is getting fiercely competitive and is changing faster than ever before. According to Gary Hamel, who is one of the most influential business thinker “change itself has changed” and never in the history there was such a big change as it is today (Hamel 2012, 85).

In these fast changing and competitive conditions, it is essential for every organization to exhibit a sense of urgency and keep-up with the changes. However many organizations today are struggling to adapt these change and compete.

Using traditional methods and tools in the change process, is somewhat inadequate, lengthy and time-consuming. At the same time there is immense pressure to save cost while decreasing time to market, which leads towards the trend of Global Software Development (GSD) (Hossain et al. 2009, 175). In general a software development process is the combination of activities such as analysis, design, build and review. Author Pries-Heje and Pries-Heje (2011) have drawn attention to the fact that GSD trend will basically allow project participants to work in distributed environments, allowing anyone to work, who does it faster and in low cost. Whereas Stoica et al. (2013, 64) states that in such a complex and continuously changing surrounding, organizational agility is no more a necessity but rather a condition to survive in the market.

Agile can be described as a unified word for methodologies and practices which are used to gain more flexibility, improved quality and business value of software solutions (Cooke 2012, 29).

A group of 17 methodologists formed the Agile Alliance in February 2011 to address challenges faced by software developers while using traditional methods and tools. Objective was to also address challenges to survive in a new economy where quick results and flexibility is demanded. Outcome of this alliance was an agile manifesto, covering values and principles defining the foundation for agile methods. There are many different agile methods available such as Scrum, XP, Crystal and FDD which supports agile software development (ASD). Today more and more companies are adopting ASD methodology and the purpose of the thesis is to further analyze the usage and application of agile practices in daily operations.

1.2 Presenting the case study

Case company for this thesis is one of the leading multinational telecom company X and the research study is focused on unit Y within the IT organization of company X. Unit Y is an IT service provider and holds responsibility to serve and support requirements related to analytical reporting and data warehousing solution towards its internal customers. There are approximately 3000 customers and 680 reports, which are used on daily, monthly, quarterly and yearly basis. Different reporting areas supported by unit Y are Finance, HR, logistic, sourcing and procurement. Unit Y is also responsible for delivering different services such as maintenance of the reporting tool, maintaining required data for reporting in the data warehouse, accepting change requirements in existing solution or new reporting requirements, end user training and support. Unit Y holds four major roles such as service manager, IT solution manager, IT design manager, while development and maintenance support is outsourced to a vendor located in India called as IDC. In current scenario entire unit Y is distributed geographically. IT solution manager together with service manager is located in Finland while IT design manager is located in Sweden and as stated above the maintenance team is located in India.

With the increase in number of users and usage of reporting, there is a constant flow of incoming change requests to improve, alter or modify the existing reporting solution. Whenever customers have some new reporting requirements or changes in existing ones they send it as change requirement towards Unit Y. Currently unit Y is following ITIL processes and traditional waterfall approach to carry out these change requests tagged to change release process. There has been lot of discussions around the current way of handling changes and how it can be improved. The old and lengthy waterfall model has its own drawbacks, such as; too much time is spent on detailing the plan even before gathering clear requirements. Business requirements are constantly changing and it has become a necessity to satisfy customers through early and continuous delivery of valuable service. With fast changing world it has also became necessity to adapt to changes quickly and follow an advanced way of working such lean method or agile software development method.

1.3 Objective

This thesis is focusing on unit Y which is considering improving its current and traditional way of working with change release process. At present a lot of discussion is going on within IT organization on improving existing services and adopting new innovative ways of working, which is in an early stage and hence management would like to understand different aspects around the topic of agile software development method. It is important to understand how

and where to begin this journey as it requires right competence and potential to make this transition smoother.

In order to better understand the management's expectations thoroughly and mutually agree upon focus of the thesis, kickoff meeting was scheduled with management team of unit Y. Participants of this meeting were my line manager, head of unit Y, and head of process management team including change release process manager. After a short introduction of master studies and the thesis structure, we briefly discussed the current ways of working and addressed open questions and challenges in the current way of handling change release process. Discussion continued with company's goals and strategies which have been updated recently. The new strategies are focused upon improving collaboration with customers, performing sustainable cost savings and developing competitive innovative pace. To support company's goal and strategies there is a need for change in existing service delivery and therefor management would like to understand if that change could be brought by adopting agile practices or not.

During the discussion a number of fundamental questions were raised by the participants to understand the key differences between waterfall and agile model. The management wanted to know, "why everyone now a days talking about agile?", "is it worth to eliminate current waterfall model which has been used since long time?", "if we decide to go for agile practices then which one would suit our organization?", "what do we need to do and how can we proceed?"

Based on the discussion, following questions were finalized for this thesis work:

- Which one is better waterfall model or agile model?
- What kind of agile methods can be used in a company?
- What can be done to start working agile?

Based on the discussion and agreed research questions the purpose of this thesis is set to analyze agile model and waterfall model and find out the most suitable method for unit Y. It is also important to consider that the entire team is distributed globally and the selected software development method should support working with distributed teams. If agile model is found to be suitable then next step is to understand which agile method should be adopted and required actions to move towards that path. Thesis aims at seeking these answers by applying service design as an approach, in order to support management for further decision making on existing service improvement.

1.4 Structure of thesis

Overall structure of the thesis is outlined below to make it easier for the reader to follow. The first chapter opens up reader to the thesis topic, background of case company and objective of the thesis. This chapter also introduces reader to the challenges, objective and research questions.

The second chapter explains theoretical framework used for this thesis. It explains the importance of service dominant logic and value co-creation along with service innovation approach. Customer role is very crucial in developing innovative services and theory explains how it can be achieved along with empirical part of the study, which is elaborated further in chapter four.

The third chapter focuses on theoretical background of software development models. It is essential to look at a variety of agile software development methods, processes and tools to build a detail understanding. Fourth chapter focuses on service design, its core principles and processes to support service design work. In this thesis iterative process of service design is used to support objectives and find out answers to research questions.

Fifth chapter represents empirical part of the thesis and it explains further research activities in detail. It elaborates the journey of thesis, starting with desk research, interviews and popular media search along with value co-creation workshop with the stakeholders. It further briefs about service design methods and its usage. Reflection part of the process delivers solution for the research questions set in the beginning. It explains the process of result verification and feedback collection from different stakeholders to improve the provided solution.

Finally sixth chapter concludes together results obtained throughout the process and provides answers to the set of questions along with guided framework for implementation steps.

2 Service innovation by applying value co-creation

As mentioned above the main purpose of this thesis is to improve existing service by adopting new innovative software development methods that support unit Y's IT strategy and help in building good customer collaboration and satisfaction. Hence this section covers the theoretical framework used for research activity. This thesis follows popular theory of Service, service –dominant logic, value co-creation along with service innovation approach.

Many companies nowadays are becoming aware of service dominant logic and thriving for service innovations. As it was rightfully stated by author Prahalad and Ramaswamy (2004, 5), in the current scenario customers don't seem to be very satisfied with the service or product even though they have multiple choices available than ever before. Top management is constantly trying to keep up with the changes and has more strategic modifications than ever before but still they deliver less value (Prahalad & Ramaswamy 2004).

According to Edvardsson, Gustafsson, Sandén and Johnson (2000) the aim of service is defined as a detailed description of customers' needs to be satisfied. On the other hand Clark, Johnston and Shulver (2000, 71) argues that, service organization should see service concept as a device to integrate its many different aspects. Based on this Clark et al. (2000, 73) suggest that service concept should be seen as a "picture" or a declaration that contains the basics of service business and captures values, form and function, experience and outcome of the service, as what is to be done for the customer and how this can be achieved. Edvardsson et al.(2005, 118) further clarify that service should not be only seen as an activity rather it's a perspective, "Service is a perspective on value creation rather than a category of market offerings".

2.1 Service Dominant Logic

Thanks to the work of Vargo and Lusch (2004, 2008) who have carried out an extensive research in the field of service marketing and have put forward service dominant logic. Over the past several decades substantial efforts have been made to differentiate services which are intangibles compared to tangible products or goods. According to Edvardsson et al. (2000, 33) there are four major characteristics which differentiate services from traditional manufactured products: immateriality, co-production, customer as a co-producer and heterogeneity.

When goods are delivered their quality can be determined by touching or using the product. But in case of services same quality determination methods cannot be employed. One can only experience the delivered service. Thus as stated by Edvardsson et al. (2000, 33) services are mostly produced, delivered, consumed and marketed at the same time and they cannot be saved or stored like goods.

Service-dominant logic (S-D logic) is defined by nine foundational premises; eight of which were initially elaborated in Vargo and Lusch (2004) and the ninth in Vargo and Lusch (2006).

These nine foundational premises have been reproduced in Table 1.

FPs	Original foundational premise	Modified/new foundational premise	Comment/explanation
FP1	The application of specialized skill(s) and knowledge is the fundamental unit of exchange	**Service** is the fundamental **basis** of exchange	The application of operant resources (knowledge and skills), "service," as defined in S-D logic, is the basis for all exchange. Service is exchanged for service
FP2	Indirect exchange masks the fundamental unit of exchange	Indirect exchange masks the fundamental **basis** of exchange	Because service is provided through complex combinations of goods, money, and institutions, the service basis of exchange is not always apparent
FP3	Goods are a distribution mechanism for service provision	Goods are a distribution mechanism for service provision	Goods (both durable and non-durable) derive their value through use – the service they provide
FP4	Knowledge is the fundamental source of competitive advantage	**Operant resources are** the fundamental source of competitive advantage	The comparative ability to cause desired change drives competition
FP5	All economies are services economies	All economies are **service** economies	Service (singular) is only now becoming more apparent with increased specialization and outsourcing
FP6	The customer is always a co-producer	The customer is always a **co-creator** of value	Implies value creation is interactional
FP7	The enterprise can only make value propositions	The enterprise **cannot deliver value, but** only offer value propositions	Enterprises can offer their applied resources for value creation and collaboratively (interactively) create value following acceptance of value propositions, but can not create and/or deliver value independently
FP8	A service-centered view is customer oriented and relational	A service-centered view is **inherently** customer oriented and relational	Because service is defined in terms of customer-determined benefit and co-created it is inherently customer oriented and relational
FP9	Organizations exist to integrate and transform microspecialized competences into complex services that are demanded in the marketplace	**All social and economic actors are resource integrators**	Implies the context of value creation is networks of networks (resource integrators)
FP10		**Value is always uniquely and phenomenologically determined by the beneficiary**	Value is idiosyncratic, experiential, contextual, and meaning laden

Words in bold type represent changes in wording from the original FPs (Vargo and Lusch 2004a, 2006).

Table 1: Service- dominant logic foundational premise modifications and additions (Vargo & Lusch 2008, 7)

As stated in table 1- FP6, "customer is always a co-creator of value" and as stated in FP10, "value is always uniquely and phenomenological determined by the beneficiary" (Vargo & Lusch 2008, 7) which in most cases is the end customer. This theory concludes that customer plays a very important and active role in the process of value creation. Several research activities have been undertaken over the foundational premises of service-dominant logic and further elaborated, one of them is value co-creation.

2.2 Value Co-creation

If we analyze the current environment around us we can feel how fast market forces are changing. Even though users have more choices nowadays in respect of services, their de-

mands are continuously increasing with respect to service quality. Tough competition and low running costs are the two major challenges that organizations are facing nowadays. Prahalad and Ramaswamy (2004) in their book The Future of competition have explained that, meaning of value and the process of creating value is drastically shifting from firm/product centric view to personalized consumer experiences. Service Innovation is getting popular and more and more service providers are focusing on it.

To be able to survive in this competitive world many companies are looking for innovative ways of working. One of the new concepts that are gaining importance these days is Value Co-creation together with customer. So what is Co-creation? Co-creation is the practice of developing new products, services, systems through a collaborative way of working. This collaboration should take place between not just a service provider and a customer but it should include everyone who is the part of the process; it could be a developer, stakeholder, customers or employees. (Prahalad & Ramaswamy 2004, 4-6.)

Neale and Corkindale (1998, 419) define co-creation as a process where the customer and originator jointly integrates in a development project by providing their own expertise. Prahalad & Ramaswamy further claim that, as customer role is changing in today's economy companies can no longer act autonomously. Customer will be an integral part of whole service design and delivery process. According to them customers nowadays have many open sources for retrieving the needed information and they are more willing to interact with service providers and want to co-create value. (Prahalad & Ramaswamy 2004, 4.)

In the article of Co-creating unique value with customers, Prahalad and Ramaswamy (2004, 6-7) have presented new model called the DART model of value co-creation.

DART: Dialogue, Access, Risk assessment and Transparency

Dialogue: It is very important to create dialogue between both parties in the process of co-creation. Dialogue should be more about listening to the customers and it is about exchanging your views and carrying out shared learnings. (Prahalad & Ramaswamy 2004, 6.)

Access: It is about sharing information and tools. In this process it is important that all relevant information is shared with customers and they are integrated in the process, which requires sufficient access. (Prahalad & Ramaswamy 2004, 7.)

Risk Assessment: It is important to carry out risk assessment, in other words one should consider possible side effects or harm that can cause some form of loss (Prahalad & Ramaswamy 2004, 7).

Transparency: There is an increased desire from consumer's side to have fare transparency about technology usage, product information, systems etc. Transparency in business terms could help to gain more trust. In the process of value co-creation together with customer, combining aforementioned building blocks would give better outcome. (Prahalad & Ramaswamy 2004, 7.)

This phenomenon of DART model for co-creating unique values by involving customer is very important from the point of view of this thesis. Therefore it is used further in the thesis by involving customers in value creation.

2.3 Service Innovation

In today's competitive market most leading companies are trying to differentiate themselves by building innovative services (Edvardsson et al. 2000, 7).

"Service innovation is the process of devising a new or improved service concept that satisfies customer's unmet needs" (Bettencourt 2010, 9).

According to Bettencourt (2010), for a successful service innovation one should shift focus from service delivery or providing service solutions and rather concentrate on customer's needs. Customer needs, their pain points, their whole service experience is very important to understand the innovation process and provides very good insight about customer's expectation.

Service Innovation Approach

Bettencourt (2010, 8-14) recommends four different approaches that can be utilized in discovering service innovation opportunities to create value for its customer and they are:

1) New Service Innovation: This approach focuses on discovering new or similar jobs, where a service can fulfill customers unmet needs.

2) Core Service Innovation: It enables customer to get their core job done with new or improved services

3) Service delivery Innovation: this approach focuses on the benefits obtained by the customer from the delivered service.

4) Supplementary service innovation: Here focus is to help customers with required supplementary help to get the most out of the offered service. This can be related to products more and it reveals opportunities for improved services by understanding customer's pain points and end to end experience by owning and using the product.

Considering the background and aim of the thesis, core service innovation approach could be used further as the purpose is to improve existing service of delivering changes which will enable customers to perform their core job in a better way.

How to develop a successful service strategy?

In order to improve existing services or develop a new service that will meet customer's requirement, it is important to have a strong strategy in place. Bettencourt in his service innovation book has defined four steps for developing a successful service strategy and they are:

- Select the innovation focus

Before starting the journey of service innovation, it is extremely important to decide the focus of innovation and the possible applicable approaches as mentioned above. Making such decisions at the beginning would help to narrow down focus and energy.

Happy customer should be the focus of service designing. Targeting right customers or customer groups is most essential as they are the ones who trust the company services. According to Bettencourt deciding the scope of investigation is important. We also have to be more practical here in deciding the scope of the innovation process, the scope should not be too small or too wide. (Bettencourt, 2010, 16-17.)

- Uncover customer needs

Once the innovation focus is decided it is time to understand customer needs. It is important to understand customer needs before going further in to any other details. To get this information out from customer, the best choice is to carry out ethnography. Perform one-to-one interview, group interviews or even carry out observation tasks to understand the core job that the customer is doing, gaps and desirable output which is a key requirement from customer's point of view. It is recommended by author to conduct interviews with a diverse group of customers in order to gain all different needs and insights pertaining to that service. (Bettencourt, 2010, 17-19.)

- Prioritize customer needs

According to Bettencourt (2010, 22-24), good service innovation opportunities can be found by analyzing those customer needs which are indeed very important but not very well satisfied. Once enough research activity is carried out and all necessary data has been gathered from customers, which includes their needs and expectation, it is time to prioritize the most important needs among them. It is important to consider that not all needs can be satisfied at the same time, so select only those where we can see some opportunities for innovation. (Bettencourt, 2010, 22-24.)

- Develop service strategy

Every company has its own defined strategy where goals/targets have been defined. An effective service strategy is important to define as it will present who our target customers are, which customer this service needs will satisfy and important elements of service concept. So an effective service strategy can be developed by focusing on a customer centric service strategy and culture. (Bettencourt, 2010, 24-25.)

Above four strategies defined by Bettencourt (2010) are very valuable input to apply in any company and to the journey of innovation. This service innovation approach is used in this thesis as the objective of thesis is to improve existing service by adopting new innovative ways of working.

3 Software development models

As stated by author Vijay Kumar, it is very important to know the context in detail and understand the surrounding conditions in which changes are taking place (Kumar 2013, 51).
Hence this section provides detail overview of unit Y's current ways of working using ITIL processes and waterfall model. Unit Y is using ITIL processes for handling all types of change requests.

3.1 Current ways of working

ITIL stands for Information Technology Infrastructure Library. ITIL has its own framework and a set of processes which provides, the guidelines on how to improve IT service quality while increasing efficiency and reducing cost. Benefits of using ITIL is that it allows IT units to understand business needs as well as provide guidance and support for its core processes by doing right things in right order. (Marquis 2006, 49.)

The ITIL best practices are currently detailed within five core publications, which are organized around service lifecycle stages. Figure 1 represents the nature of service lifecycle where service strategy is the core of all, whereas service design, transition and operations are revolving stages or spokes. Continual service improvement supports and surrounds all these stages like the rim of wheel. (Farenden 2012, 38-39.)

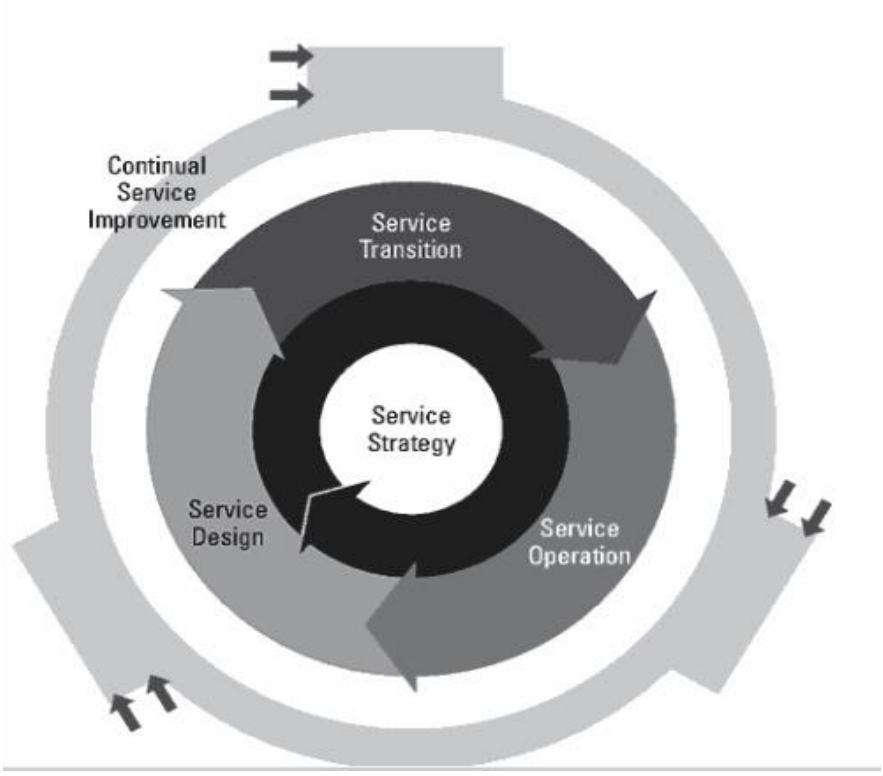

Figure 1: The service lifecycle (Farenden 2012, 39)

As mentioned by author Jamie Cooke (Cooke, 2012) changes in the ITIL framework are implemented in command and control model. At the moment Unit Y is using waterfall model to support ITIL ways of change management.

3.2 Waterfall model

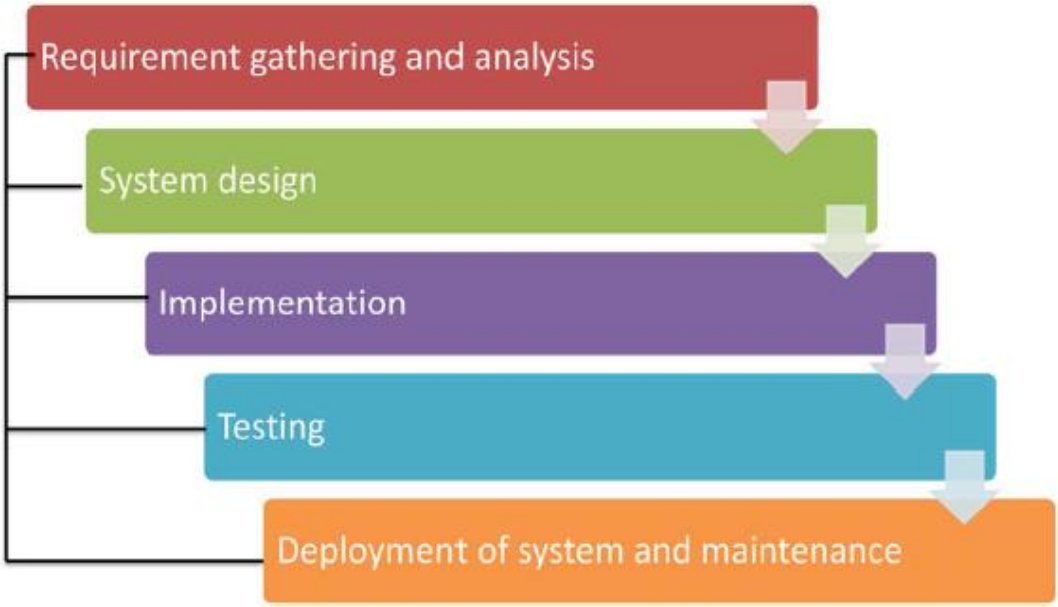

Figure 2 : Waterfall model diagram (Stoica et al. 2013, 66)

The waterfall model was first defined by Winston W. Royce in 1970 and it is a linear sequential life cycle model which is very systematic and plan driven development model. It is often referred to as classic software lifecycle (Stoica et al. 2013, 66). It has one after another execution steps defined as shown in the figure 2 above and each phase needs to be ready before proceeding to next phase, because the output of preceding phase acts as an input to next phase. Basically it acts as an input to the next phase. Different phases involved in waterfall development methodology are: requirement gathering, design, implementation, verification and maintenance. Thorough planning and detail documentation at each stage maintains the good quality as objectives of each stage are clearly mentioned and reviewed at the end of each phase before moving to next phase (Ullah et all. 2011, 78).

Besides its advantages there are some disadvantages as well, such as development planning is performed in very early stage leading to some design flaws. Due to sequential process and fixed scope in early stage, it is unable to accept late changes in requirements. Development process is very lengthy. Communication gap between stakeholders of different stage can lead to defects and delivery delay. (Ullah et all. 2011, 78.)

To gain better understanding on existing change release management process and unit Y's activity through each and every stage of waterfall model, desk research and interviews with subject matter expert were conducted and these are described later in the thesis. Description of each stage below is taken from Unit Y's current ways of working.

- Requirement gathering

First phase is requirement gathering, where business needs are analyzed and requirements are collected with all the needed details. In the current setup at unit Y, IT design manager is responsible for collecting requirements and creating change release document.

- Design

Requirements collected earlier are further studied in this phase and design of the solution is prepared. In this phase documentation of technical specifications and functional specification is carried out which is then further used as an input to the implementation phase.

- Implementation

Suggested changes are implemented in this phase. As soon as the development is completed, technical team which is responsible for implementing changes will carry out initial integration testing. This is conducted to verify that implemented changes are matching with the requirements specified.

- Verification

Unit testing is carried out and solution is tested by business for the approval purpose. Set of key users are assigned for this task and they are responsible for defining test cases. Unit Y is using a testing tool where they actually record all test cases relevant for project and set valid status after testing. If any defects are found then they are informed to the developer and developer is responsible to fix and close recorded defects in test tool.

Before going to the maintenance phase, change request coordinator will call for the go- no go meeting. In this meeting decision will be taken based on whether implemented changes are according to the requirement or not.

- Maintenance

After seeking valid approvals changes are taken to production and maintenance phase continues from here.

After analyzing current ways of working, next action is to understand agile development methodology, different agile methods and evaluating agile vs waterfall approach.

3.3 Agile Software Development (ASD) methodology

Agile development is defined as an incremental approach or an iterative process in the world of software development. Author Jamie Cooke further defines agile as a collective term for

methodologies and practices which are used to gain the flexibility, quality and business value of software solutions. These are also used to identify problems in the IT industry such as budget overruns, missed deadlines, low quality results and dissatisfied customers. (Cooke 2012, 29.)

According to author Moreira (2013), there is no single “Agile process” or “Agile methodology”. It is a set of values and principles and various processes, methodologies, frameworks and best practices established in order to support theses Agile set of values and principles. (Moreira 2013 , 49-50.)

Below are some of the objectives of ASD methodologies defined by author Cooke:

- To replace upfront planning with incremental planning
- To build the quality in the beginning phase and then have continuous improvement throughout process
- To identify potential risks as early as possible
- To allow and accept changing requirements flexibly
- To build trust and empower the staff continuously delivering high value (Cooke 2012, 29-30.)

Agile Manifesto

On February 11-13, 2001 a group of seventeen industry experts gathered and come with the idea of agile manifesto. Aim was to discuss and find some answers for problems related to software development related processes and as an outcome agile manifesto was generated (Beck et al. 2001).

Four values based on manifesto are:

“Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan
That is, while there is value in the items on the right, we value the items on the left more”.
(Beck et all. 2001.)

Principles behind Agile manifesto

Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

Business people and developers must work together daily throughout the project.

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Working software is the primary measure of progress. Agile processes promote sustainable development.

The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

Continuous attention to technical excellence and good design enhances agility.

Simplicity--the art of maximizing the amount of work not done--is essential.

The best architectures, requirements, and designs emerge from self-organizing teams.

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

Figure 3 : Agile Manifesto (Beck et al., 2001)

Agile development Methods and tools

As stated by authors Jayakanth and Kristina, it is important to have clear understanding of mechanics and dynamics of value creation in the process of adopting agile methods. Successful Agile adoption from mechanics aspect is when, the process of information towards stakeholders and their alignment towards common objective is secured, required authorities for making decisions have been given to employees, efficient project management exists and provides the environment which supports individual and group learnings. Whereas dynamics of value creation comes from effective governance strategy, building organizational learning system and understanding value propositions. (Srinivasan et al. 2009, 63.)

Some of the most commonly used agile methodologies are (Cooke 2012, 44-64)

- Scrum
- Feature driven development (FDD)
- Extreme programming (XP)
- Dynamic systems development method (DSDM)
- Lean development
- Rational unified processes (RUP)
- Agile unified processes(AUP)
- Hybrid and emerging Agile methodologies

Considering current working scenario of unit Y, thesis will further focus on Scrum, Kanban and lean development approaches in detail.

Scrum

Scrum was originally developed in 1990 by Jeff Sutherland and Ken Schwaber (Robson 2013 ,25). Scrum is an iterative management methodology used to build incremental framework which inspects and adapts processes to support development and it consists of different scrum roles, rules, events and artifacts (Moreira 2013, 50).

In scrum, iteration is defined as a sprint and objective of each sprint is to produce a workable output, which has been tested and is ready to be deployed to production (Robson 2013, 25).

Scrum team is a group of committed and motivated employees, playing major role in providing agreed outcomes. Different roles defined within scrum are scrum master, product owner and development team (Moreira 2013, 50).

Product backlog is used to collect business requirements and manage scope accordingly for each sprint, output derived as result of each sprint is then further utilized as an input for next sprint (Robson 2013, 25). When one or more sprints are missing or getting delayed then it reduces the overall effectiveness of the process.

Kanban

Kanban is a Japanese term referred as “signboard” or “story card” (Moreira 2013, 55)
It is an agile methodology used for managing changes and daily maintenance workload in IT companies such as:

- Ensuring regular outputs
- Accepting changing requirements
- Making work transparent to all stakeholders in order to improve communication, collaboration and issue resolution.
- It can be also combined with other agile methodologies such scrum or lean in order to gain more control and flexibility. (Cooke 2012, 55)

As stated by author Robinson multitasking is about doing many things poorly, so by reducing multitasking, eliminating waste and addressing bottlenecks lead-time can be improved (Robson 2013, 25).

Kanban boards are used to visualize overall workflow; it gives overview on teams’ planned, current and completed work. It is possible to identify if there are any bottlenecks as piled up work can be easily seen on the board. Also teams’ availability to accept additional work can be quickly analyzed from board. (Cooke 2012, 54.)

Lean Development

It is an approach used for building value by eliminating waste and defining - what is needed, when it is needed and building it with fewer efforts. It focuses more on providing customer value (Moreira 2013, 56).

Authors Mary and Tom have defined 7 key principles for lean software development as below:
1. Eliminate waste
2. Amplify Learning

3. Decide as late as possible
4. Deliver as fast as possible
5. Empower the team
6. Build integrity in
7. See the whole (Tom and Mary, 2003.)

Tools supporting ASD

There is increase in demand for support tools to work with fast and constantly changing requirements of ASD. The increased demand on delivering customer satisfactory results in an iterative way calls for innovative decision support tools (McHugh & Acton 2012, 453-454).

McHugh & Acton have listed down some of the existing tools such as word processor, spreadsheets and presentation software along with some agile specific software applications which include Rally, Green hopper, Jira, VersionOne and Hansoft (McHugh & Acton, 2012, 458). According to VersionOne 9th annual survey, most commonly used tools are standard office productivity tools such excel, Microsoft project, VersionOne and Jira (VersionOne, 2015)

Company X is already using tool Jira in some of its other units, so it is great opportunity for unit Y to start their agile development work with the help of Jira tool.

Agile ways of working for distributed teams

As per the current scenario, unit Y has outsourced its development and maintenance services to a third party located in India, so it is a globally distributed team. Author Sungkur & Ramaswamy elaborate this as common practice performed in today's world due to several reasons like saving maintenance and production cost, skilled labor at cheaper rates, reducing time to market and to gain improved quality. On the contrary to benefits they also point out some of the disadvantages of globally distributed teams such as time, distance and cultural differences. (Sungkur and Ramaswamy 2014, 395.)

From the point of view of this thesis, it is also important to understand facts about agile practices for globally distributed teams and analyze if any risks in advance.

Figure 4 represents global Agile team configuration framework created by author Sharp & Ryan (2011, 121).

Team Agility: the most important dimension of the framework is team agility, which comes from the principles defined in Agile manifesto such as working software, customer collabora-

tion, individuals and interactions over processes, adapting change, motivating team members etc.(sharp & Ryan 2011, 121).

The second major dimension of the framework is team "virtualness" which consist boundary spanning and temporal distribution. Which means a team can be cross functional, organizational along with cultural boundaries whereas temporal distribution indicates teams distributed across different time zones, and it is stated by authors that it is okay if the time difference is at minimal level. (Sharp & Ryan 2011, 122.)

Last but not least, third dimension and foundation of a virtual team is team structure. It is very important to build the right team structure for gaining effective results with distributed teams and some of the sub dimensions mentioned by authors are task design, core norms of conduct, team composition and team processes.(Sharp & Ryan 2011, 122-123.)

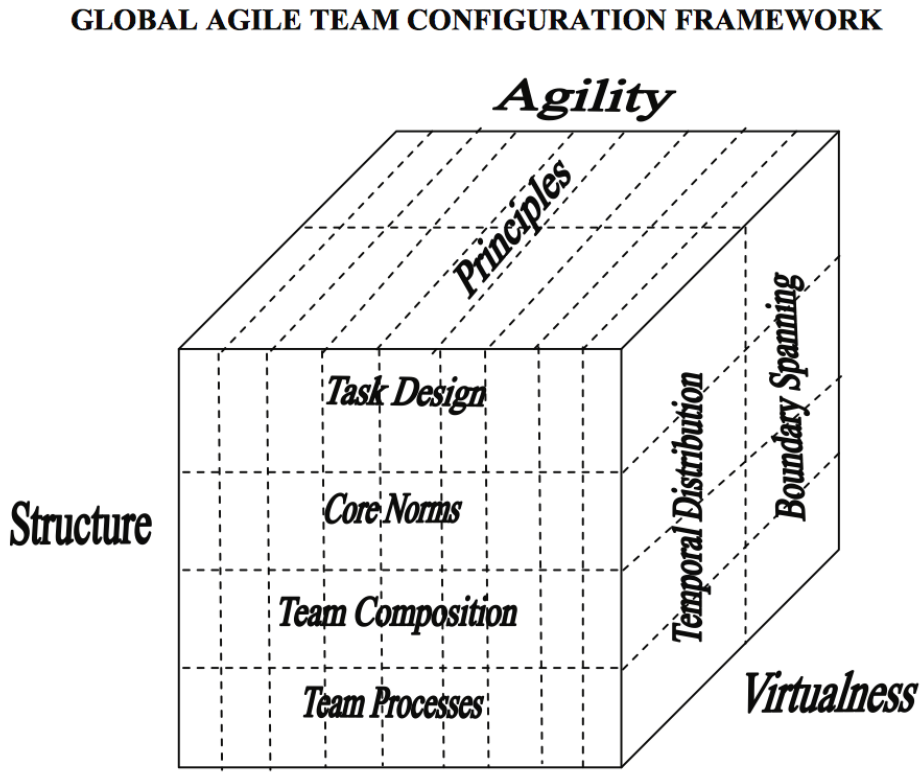

Figure 4 : Global Agile team configuration framework (sharp & Ryan 2011, 121)

Author Davis Barbee mentions in his book that if the team has necessary expertise in one location and considering that they are cross functional, then it is very much possible that each group can work from different locations (Davis 2012, 151).

By using advanced communication tools like video conferencing, instant messaging, web cams and 3D telecommunications it is also easy to set meetings across geographic locations (Davis, B 2012, 158-159). In case of Unit Y the development and maintenance team is at one location along with cross functional expertise. Also company X itself is one of the leading telecom companies and being international it is already using teleconference services for its own internal use. Hence as per the studies, working agile for unit Y with globally distributed teams should not be of any issue.

However as per the recommendation of Korkala et al. (2009), in the case study of customer communication challenges, considering the fact that teams are distributed globally it is very crucial to have efficient communication in place and hence organizations should focus on building effective customer relationship by enabling substantial communication channels (Korkala et al. 2009, 166.)

Agile adoption readiness assessment

Shiri et al. (2015) suggest that to survive in the current constantly changing environment, organization needs to be Agile to be able to carry out required changed quickly and efficiently. Hence it seems to be important to conduct organizations readiness assessment to analyze strengths and weaknesses. (Shiri et al. 2015, 56.)

Cooke (2012, 75) in his book has suggested going through six critical questions for the assessment as below:

"Question 1: What are the biggest challenges in my organization?"
By asking this question author Cooke has suggested to analyze different factors causing issues or challenges in current working environment such as,
Quality: with current solution in place are we able to deliver high quality solution which meets business demand?
Timeframe: in the current environment are we able to keep up with agreed timeline and assigned budget?
Requirements: what type requirements are we receiving? Do we receive business requirements that keep on changing or are they fixed in the beginning? Cooke (2012, 75-77.)

"Question 2: Am I looking for a quick fix solution?"
Author Cooke (2012, 77) has suggested to consider the fact that implementing ASD methodology may take several weeks or month, and it will also take time for teams to get aligned with Agile methods and way of working. Taking this in to consideration organization has to be pre-

pared that there might be some extra cost required in the beginning for arranging agile training and pilot process. Hence it is important to keep in mind that there wouldn't be any immediate decrease in ASD cost rather it could be seen on long term cost savings. (Cooke 2012, 78.)

"Question 3: Are the people in my department prepared to change their "business as usual" routines?"

It is very important to understand people's mindsets who are supposed to work in the agile team, hence it is important to assess if the organization has motivated, enthusiastic and skilled employees who are willing to change and ready for adopting new ways of working. (Cooke 2012, 78-79.)

According to VersionOne (2015, 10) 9th annual state of agile survey, company culture resistance towards adopting agile values has caused 42% failures for agile projects.

"Question 4: are your executives prepared for your department to use agile approaches?
As the question itself elaborates it is important to secure management support and motivation for moving towards agile ways of working (Cooke 2012, 79).

According to VersionOne (2015, 10) 9th annual state of agile survey, lack of management support has caused 38% failures in agile projects.

"Question 5: Are you prepared for agile?"

As per the agile manifesto created by Beck et al. (2001), one of the core values of agile is about empowering people so that they can work independently, forming self-organized teams. Keeping these agile values in mind author Cooke (2012, 80) suggests here that directors and managers have to build trust and empower their staff by delegating authorities. By adopting agile methodologies management can be sure and confident that work is progressing without any interference or continuous monitoring in place and allowing the staff to manage their work they are committed to. At the same time it is very important to have right and dedicated resources in place to work with ASD.

"Question 6: Are the intended participants sufficiently aware of agile principles and practices?"

According to VersionOne (2015, 10) 9th annual state of agile survey, the top most causes of agile project failure is lack of experience with agile projects. There is a great need to check if we have the right level of experience in our team in order to work agile. It is not enough for the agile team to only understand the methods and way of working with it as it can cause misapplication of agile approaches. It is very essential that people working in agile team understand the principle and core values that underpin agile practices. (Cooke 2012, 82.)

3.4 Scrum

3.4.1 Why Scrum?

Scrum is a term taken from rugby sport, which refers to a rule of restarting game after an accidental violation. The history of Scrum can be traced back in 1986 Harvard Business review, outlining the significance of empowered and self-organized teams (Rubin 2012, 3).

According to statistics presented in VersionOne 9th annual state of agile survey, Scrum is the most popular and widely used agile software development method. As per survey results the majority of participants did use Scrum as an agile software development methodology with 56% of results and next is Scrum and XP Hybrid model which shows 10% result of the overall used methodologies. Scrum clearly dominates in the most used agile methods while rest of the methodologies stands even lower than 8% in its usage. (VersionOne 2015, 2, 9.)

It is important to understand benefits of Scrum and analyze the reason behind popularity of its usage in general, which is explained further in this section.

In the book Essential Scrum, author Kenneth S. Rubin has presented benefits of Scrum experienced by different organizations as shown in figure 4.

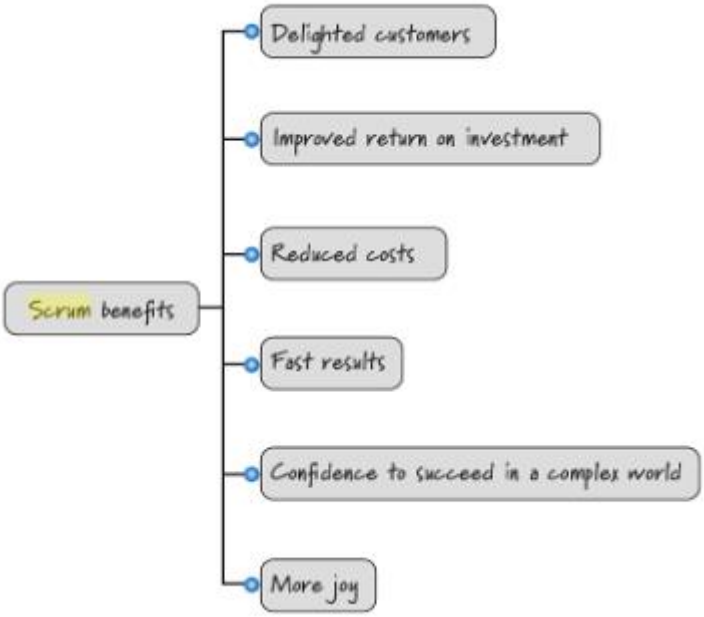

Figure 5 : Scrum benefits (Rubin 2012, 6)

Delighted customers: Customers are delighted as true needs are identified and satisfied by delivering features that are needed rather than just features mentioned in the very beginning.
Improved ROI and reduced cost: better ROI achieved by delivering results in small and frequent batches, by eliminating waste and reducing costs.
Fast results: rapid results gained by delivering output in small, tested and ready to ship batches.
Confidence: continuous iterations, feedback loops and communication build trust between customer and development team.
Joy: Continuous and meaningful collaboration brings joy in working together. (Rubin 2012, 6.)

Scrum also supports working with distributed teams and author Sutherland, Viktorov, Blount and Puntikov explains three different distributed scrum models. They are “Isolated Scrums”, “Distributed Scrum of Scrums” and “Totally integrated Scrums”. Distributed Scrum of Scrums is recommended as best practice by Scrum Alliance. Case study by Sutherland et al also concludes that outsourced teams and distributed teams can be as efficient as collocated teams. (Sutherland et al, 2007.)

In a case study conducted by Pries-Heje and Pries-Heje on distributed agile team, it has some additional benefits of scrum apart from what is already mentioned above in figure 5 and they are: scrum meeting structure establishes good communication between team members and it has effective ways of following project progress (Pries-Heje 2011, 27).

Scrum benefits mentioned above clearly fits into the IT strategy of unit Y. Scrum method supports the iterative methodology of agile and it also provides a systematic process to work while providing flexibility for scrum team. Jira tool which currently used in company X also supports Scrum framework by creating product backlog and sprints. Considering flexibility of Scrum to work agile, its simple process, Jira tool and its own added benefits supporting IT strategy makes it a strong necessity for unit Y. From the conducted research for best suitable agile method in case of unit Y, recommendation is to use Scrum development framework as it is the most suitable method and easy to adapt in unit Y.

3.4.2 Scrum Roles and responsibilities

As stated by author Frank Cervone scrum model is based on three major pillars: roles, process and artifacts (Cervone 2011, 20). Different roles defined within scrum are scrum master, product owner and development team (Moreira 2013, 50).

While moving from traditional project handling to ASD, it is important that everyone within organization accepts the change and embraces the agile mindset. And it is strongly recommended by author gaining understanding of agile roles and implementing those as a first step should be the part of deployment model. (Moreira 2013, 113-114.)

Below are the core scrum roles that are defined by process:

3.4.3 Scrum team

Scrum master, product owner and development team together forms a scrum team, whereas there can be other different roles but these are the major roles which forms scrum framework. Product owner is responsible for collecting requirements and organizing them in order. Scrum master is responsible for guiding the team in following the process and development team is one responsible for delivering the requirements that have been collected by product owner. (Rubin 2012, 15.)

It is recommended to have a scrum team not more than 7-10 members, in large projects it could be expanded but then project should take care of communication between different teams along with backlog grooming and organized scrum meetings. (Wan et all. 2013, 61)

Scrum master

Scrum master acts as a facilitator or coach who is responsible for ensuring that scrum roles, events, rules and artifacts are followed by scrum teams. He/she is the one produces sprint burn down chart and other matrices in order to keep track of the development activities. Scrum master also supports product owner in order to organize product backlog effectively and efficiently. (Moreira 2013, 115.)

Product Owner

Product owner is the owner of product backlog, who indeed represents the voice of customer. He/she is responsible for collecting needs and requirements from many different customers and prioritizes them according to their values, which is one of the most demanding parts of the process. (Moreira 2013, 118.)

Product owner is the one who is responsible for creating return on investment objectives and release plan based on project requirements, which also allows to raise needed funding (Schwaber 2004, 59).

Development team

Development team is a group of cross-functional engineers working towards the desired output independent of any help from outside the team. Required skillset within team is analysis, design, programming, configuration management, technical writing and testing along with tight cooperation and collaboration.

Key activities performed by development team are attending daily scrum meeting to follow-up and update status closely, participation in sprint planning and decomposing stories in to smaller tasks, contributing to sprint retrospective which is more about lessons learned and last but not least close cooperation with all relevant stakeholders. (Moreira 2013, 120-122.)

Above input on scrum team formation will be used further to analyze current organization setup and understand changes that needs to be performed in order to align with Scrum development framework.

3.5 Agile development life cycle using Scrum

Scrum events include below (Moreira 2013, 51):
In agile product development lifecycle using Scrum, feedback loops are used in order to receive feedback from customer and accordingly make any changes in the requirements, cost and goal of that sprint also known as inspect and adapt loop.

Robson(2013) has defined scrum iteration as a cycle of tasks including planning, analysis, design, coding and configuration, testing in each sprint and below we will go through each stage in detail (Robson 2013, 134). In other words Scrum framework is built on five major activities: kickoff, sprint planning, sprint, daily scrum and sprint review. The last component of scrum framework is based on scrum artifacts which include product backlog, sprint backlog and burn down charts (Cervone 2011, 20-21).

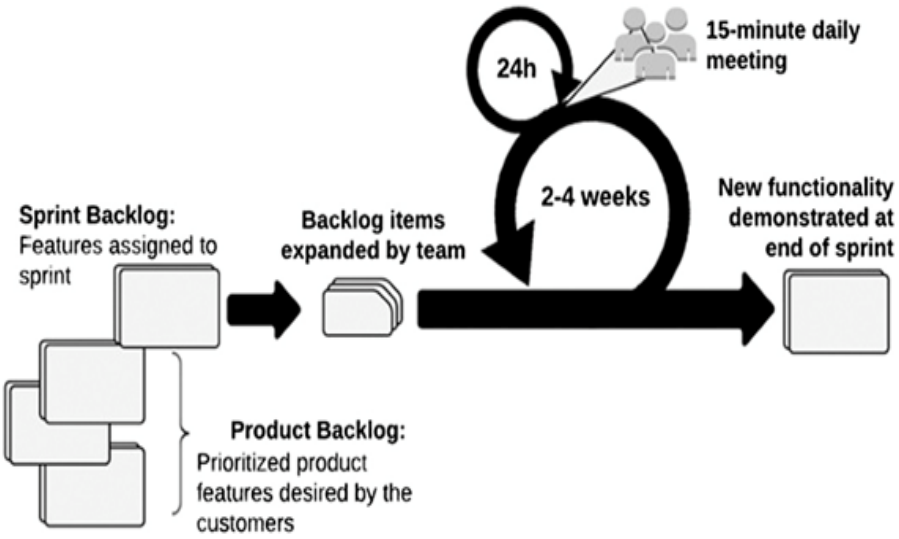

Figure 6 : The Scrum process model (Boehm and Turner 2005)

Sprint Planning

Scrum team members along with users and product owner are involved in sprint planning workshop in the beginning of each sprint. Aim is to go through business requirements and user stories to plan the work for that particular sprint. (Moreira 2013, 51.)

The outcome of sprint planning meeting is first the product backlog created on the basis of business requirements and later is sprint backlog (Cervone 2011, 20). Sprint backlog is the output of sprint planning which indeed is a subset of product backlog, containing the detail level tasks for each story and required hours for completing that particular task (Robson 2013, 135).

Daily Scrum

It is a daily stand-up meeting for no more than 15 minutes. The purpose to held it each morning is to go through quickly with current status, review required work from team and address any issues or dependencies as such (Cooke 2012, 45).

As mentioned by author Cooke (2012, 45), in this meeting every member goes through three main questions:

1. What did you do since last scrum?
2. What are you doing until the next scrum?

3. What is stopping you getting on with your work?

However the author points out that the idea of having daily scrum is not to solve problems or go through issues in detail but to track the progress of entire team and follow commitments in order to proceed with work in an unimpeded manner. (Cervone 2011, 20.)

Sprint review

Sprint review is held at the end of each sprint and idea is to go through deliverables of that sprint and gain customer feedback. It is all about inspect and adapt, as solution will be inspected together with customer and if any change in requirements that will be adapted further. (Moreira 2013, 52.)

Sprint iterations can be of any length and not limited to any particular number as team has to decide the most suitable time. According to Dr. Dobb's agile adoption survey, the most popular iteration length is for two weeks (Ambler, 2008).

Sprint Retrospective

It is the last event at the end of sprint used to demonstrate completed work and retrospective view of work done to enable continuous improvement in iterations (Moreira 2013, 52). Retrospective meeting is held between scrum master and scrum team. Agenda is to go through issues or obstacles experienced during that sprint, sprint backlog evaluation, lessons learned and developing improved ways of working with future sprints. (Sutherland & Altman 2009, 350-355.)

Scrum artifacts

As seen above scrum artifacts are based on product backlog, sprint backlog and burn down chart. Backlogs are more about collective list of user or project requirements whereas burn down charts represents progress of the work.

According to author Cervone (2011, 21) product backlog is output of kickoff or sprint planning meeting which has collected project requirements and noted as prioritized list of backlog items. Sprint backlog is a list of sprints and each sprint has its own deliverables described and prioritized with time frames (Sommer et all, 2015, 35) . Sommer etc all (2015) also states that sprint backlog may not be changed when sprint is ongoing, when sprint is over results are evaluated against product backlog. If any changes are required based on customer feedback and new requirements then product backlog might be modified in agreement with relevant

stakeholders. Once the new product backlog is ready, new sprint backlog is developed based on it and new sprint cycle will get initiated. These way iterations continue until requirements listed in product backlogs are accomplished. (Sommer et all, 2015, 35-36.)

Entire sprint progress is monitored using two-dimensional burn down chart, which gives a visual overview of tasks progress within that sprint. The graph represents the complete sprint time period versus sprint task times. This way if any task is getting delayed then it will be immediately noticed on chart. (Sommer et all, 2015, 35-36.)

From the thesis point building understanding on Scrum process is very essential as it is used further to create a service blueprint of Scrum development process for unit Y.

4 Service Design

"The world is becoming characterized by services"
(Ostrom et al. 2010, 1).

According to the author, most developed and leading economies in the world are now dominated by services rather than products (Ostrom et al. 2010, 1). Over the period services have become core of business and research. Consumed services which are intangible defines the experiences and both public and private sectors are facing challenges to cope up with increasing demand at the same time delivering quality with reduced cost. (Isomursu et al. 2013, 3.)

4.1 Definition

There is no common definition of service design; everyone has their own way of describing it. Stickdorn defines it as an interdisciplinary approach which combines different tools and methods from various disciplines (Stickdorn 2013, 22).

Moritz (2005) elaborates further stating that service design can be used to create new innovative services and to make existing services even better to make them more useful, usable and desirable for clients as well as for organizations. Whereas according to Koivisto (2011), service design thinking is about analyzing and interpreting complex raw data into requirements using different tools and methods, which could further help to identify problems and new innovative ideas.

Moritz (2005, 42) has further identified on what makes service design more unique. It is more from client perspective as it considers understanding purpose, need and motivation behind it.

Analyzing different touch points while designing a service fills the gaps and unique features are identified in the process. Service design is iterative and core of it is to prototype and test results which makes it more interactive. (Moritz 2005, 43-47.)

Whereas Stickdorn (2013, 26) defines five core principles of service design as below:
1. User centered: Services should be customer centric and needs to be experienced through their eyes.
2. Co-creative: required stakeholders should be involved in service design process
3. Sequencing: Visualizing service as a sequence of interrelated activities.
4. Evidencing: A service can be intangible and one should visualize its physical artefacts
5. Holistic: Complete end to end scenario of a service should be considered.

By continuously applying these core principles to all the elements of service we can provision services that are truly satisfying and valuable. Some of the key benefits of applying service design is, it works throughout the organization bringing benefits for both customer and organization, continuous collaboration helps in changing corporate culture while delivering high values with better efficiency (Moritz 2005, 57).

4.2 Service design process

There are many processes defined out there on designing a service concept along with the tools that can be used in each phase. However Stickdorn (2013, 118) suggest that it is very important to be analytical towards the theory or design process one would like to select as the end result is based on followed process.

Figure 7 : service design process (Moritz 2005, 123)

Moritz (2005, 123) has further divided tasks of different service design stages into six categories as shown in figure 7 which comprises of getting insights, applying service design thinking followed by conceptualization and ending with explaining and implementing the results.

Keeping above suggestions in mind, in this thesis the iterative process of service design by Stickdorn is adopted. Stickdorn (2013, 113) defines service as an iterative process and further explains the service design process along these four iterative stages. As shown in below diagram four steps that make up design structure are Exploration, creation, reflection and implementation. He further elaborates it as well thought out approach as it is very important while designing any new product or service, to avoid any types of last minute surprises like resources, budgeting and time and hence this process shouldn't be considered as a prescriptive (Stickdorn 2013, 115).

Taking this into consideration it is important to know that this process gives the flexibility to take a step back wherever it is needed or to even start it all over again from the beginning (Stickdorn 2013, 117).

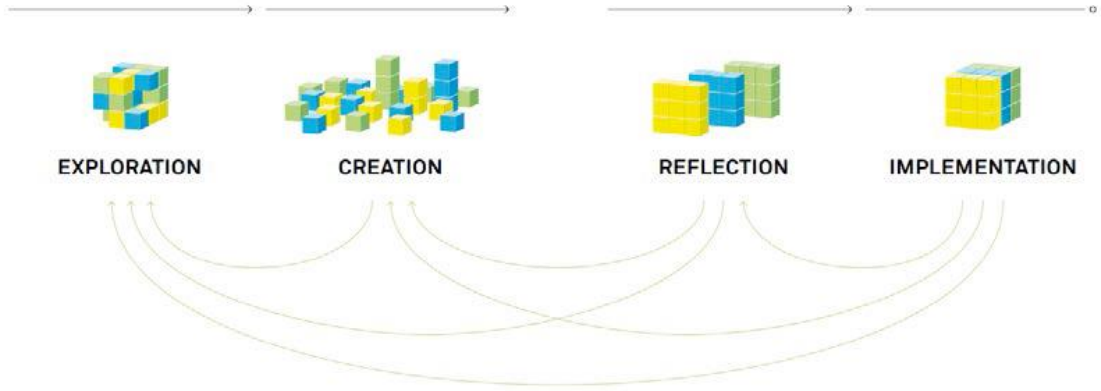

Figure 8 : The iterative process of service design (Stickdorn 2013, 115)

Along with different service design processes in place it also provides tools and methods to work on the solution (Polaine et al. 189). Several methods support each stage of this service design iterative process and the one which were used during thesis workshop will be elaborated further in detail. However Stickdorn (2013, 140) argues that there is no specific combination of tool set for each stage neither any right or wrong way of using it as any tool can be used in combination to achieve successful results.

Exploration

This stage elaborates three important tasks which need to be considered while beginning the journey. The first task of a service designer is to understand company culture, its goals, vision and analyzing its readiness for the change and acceptance for service design thinking. Second task is about finding real problem first, understanding situation from customer's point of view rather than jumping in to solution. Third task is to visualize these finding with help of various tools and methods. (Stickdorn 2013, 120-121.)

As stated by Kumar (2012, 10) in the seven modes of design innovation process, looking for latest happenings around, mapping trends and analyzing the overall purpose of why and where we should go further forms the good foundation for journey further.

Popular media search

According to Moritz (2005, 124) it is important for a service designer to understand the context in detail to make sure that outcome is holding the reality, which is also suitable and applicable. On the other hand it is also useful to carry out market analysis, latest trends, competitors and their strategies (Kumar 2012, 10). One of the research question agreed for thesis is to understand whether waterfall model is better than agile or vice versa and in order to find answer for it and extensive research needed using scientific articles, journals, books and other resources available online.

Popular media search method is about exploring media for understanding the relevant context. Purpose is to look for useful insights over the context in different media sources, such as broadcasted media, newspaper, journals, articles, books or magazines. Final result should be a observation document which reflect the trends, different ideas and assumptions around that topic. (Kumar 2012, 63.)

Kumar (2012) suggest five step approach for conducting popular media search, first is to identify relevant topics, second is to identify sources which provides insightful information, third is to frame searches and sharing results, fourth is extracting, reviewing and documenting all observations and last but not least is citing sources correctly. Some of the benefits of this method is capturing knowledge, analyzing cultural patterns and having shared understanding. (Kumar 2012, 63.)

Stakeholder map

Stakeholder map is used in the very early stage of design process. Preparing a stakeholder map requires lot of desk research and it should represent different stakeholders like employ-

ees, customers, third parties and their relation either drawn in visual or physical presentation style (Van Dijk et al. 2010, 143).

Stakeholder map can be drawn in any format, only the essential part is as mentioned above it should be able to identify different types of customers like external, internal and connection between them. This way it is possible to highlight issues concerning some specific areas. (Van Dijk et al. 2010, 144-145.)

According to author (Kumar 2012, 11) it is very important to understand people or different stakeholders and their interactions in daily life, in order to gain most valuable insights.

Interview

In the thesis two types of interviews are conducted, one ethnographic interview and the other is subject matter expert interview. Direct interviews with subject matter experts or users who have experienced the service indeed provide real insight of the matter. Interviewing users gives the possibility to study people in their own environment, analyzing their behavior while experiencing it and reasons behind that behavior, analyzing the data to gain better insight (Portigal 2013, 3).

Ethnographic interviews are not like typical interviews where questions are scripted; rather it is about learning the user experiences through their own voice and stories. Aim of the ethnographic interview is to perform it at the actual place where the activities are being performed, which allows interviewer to demonstrate the activities rather than just explaining, at the same time interviewee can experience it and gain real insights. (Kumar 2012, 111.) Kumar (2012) suggest to conduct such interviews in 5 step approach, 1) by planning the interview protocol, 2) gathering together all needed resources for interview, 3) visiting the location or context where activity is being performed and building trust, 4)collecting notes, phots and recording conversation, 5)discuss and compare results. This will help to build great insight by experiencing it.

If there is a need for building understanding around any topic in short time, then it is always beneficial to hear it from the subject matter expert. It helps in understanding crucial information, facts and opinions, latest trends or future roadmaps directly from the experts. (Kumar 2012, 83.)

Creation

After gaining customer insights and doing little exploration it is time for testing and retesting ideas and concepts. The goal of this exercise is not to avoid mistakes but rather to explore and learn from these mistakes. It is important to fail early and learn from it, gain solid understanding and then move to the next implementation stage. Further author describes that one of the important characteristic of a good service designer is to achieve co-creativity among multidisciplinary teams within the process. (Stickdorn 2013, 122-123.)

Customer journey maps

Customer journey map provides a very simple but structured diagram, which illustrates customer's experience throughout the service. Aim for using customer journey map is to figure out essential components of the service and identifying problematic areas where improvements are needed (Design Council 2013, 11).

This Journey represents different touch points where user interacts with the service. Touch point could be anything, from interaction with the service via digital media, telecommunication or face to face interaction. Once all the necessary touch points are identified then it is easy to make visual representation out of it, which further helps in analyzing the up's and down's in service experience from a customer's point of view. At the same time it is also mentioned to not to focus only on touch points but to also note experiences or stories behind those. (Stickdorn 2013, 151-154.)

While it is also suggested to have cross functional team along with end users participation, in order to gain overall understanding of the journey and analyzing how and when value gets co-produced (Sangiorgi & Meroni 2011, 242).

Mind Map

Buzan(2006, 6) defines mind mapping as a dynamic tool, which promotes faster thinking and planning. It is referred as great tool for problem solving by Buzan (2006, 13), which helps in analyzing, collecting and sorting different ideas and key words connected to the center topic. According to Buzan (2006, 13), this tool helps in creating more creative ideas and solutions by analyzing questions like where you are, what do you want to achieve and how to get where you want to be.

Mind map is a tool used for visual presentation of our thoughts and their connections. This tool is used in a way that the topic or problem that has to be discovered further is put in the center and then different drawing options are utilized to represent our ideas or thoughts. For e.g.: lines, different objects, images can be drawn to present the idea. (Buzan 2006.)

Mind map can be used for processing information by receiving, storing, analyzing, controlling and detailing (Buzan 2006, 13). Author Budd (2004, 4) suggest that brainstorming should be conducted as an initial step for creating mind map, also it is important to conduct this activity as group work rather than individual activity in order to generate deeper analysis by brainstorming.

Brainstorming can be used as an excellent group assignment tool for idea generation. This ideation method was introduced by Osborn in 1963 and aim is generate ideas freely without any criticism. (Moritz 2005, 210.)

Once idea generation is completed, group can further focus on suggestions that need to be considered and worked upon further.

SWOT analysis

SWOT stands for Strengths, Weaknesses, Opportunities and Threats.

SWOT analysis is known as one of the most popular method from ages, for discovering strengths, weaknesses, opportunities and threats. It can be used to analyze many different factors inside and outside of the organization, like analyzing our own strengths and weaknesses, analyzing market situation, opportunities and competitors etc. (Kumar 2012, 81.)

In order to use this method first one needs to set goal on which this will be conducted. Kumar (2012, 81) has explained each factor as below:

Strengths: This helps in identifying existing positive things, which can bring some advantages and utilized further.

Weaknesses: Analyzing things, which ones are not working as they should, analyze obstacles and disadvantages comparing to competitors in that area.

Opportunities: Market analysis for looking at the future perspectives relevant to goal.

Threats: is about analyzing internal and external threats, barriers in existing service and understanding the nature of competitors. (Kumar 2012, 81.)

Reflection

Once ideation and conceptualization is carried out it is time to prototype and tests your minimal viable product with some of your customers. This way it is possible to gain feedback at early stage, improve prototype consequently and then retest until it matches your customer expectation. Unlike products services are intangible hence to help customer envision service outcome many different methods and tools like role play, storyboarding etc. can be utilized. (Stickdorn 2013, 124-125.)

System Map

Working model or processes of service systems can be presented visually using a system map. Basically it is used to showcase different stakeholders engaged in to design, development and implementation stages while depicting the communication flow and interdependency for different criteria. (Meroni et al. 2011, 259.)

System map helps in analyzing end to end process flow, how the entire service flow works and key interactions among partner organizations. Which further gives deeper understanding of responsible stakeholder playing roles in different stages of the process and their influence on overall service delivery. (Meroni et al. 2011, 259.)

According to Meroni et al. (2011, 260), this tool can be used by non-service designers as well. Hence for better representation it is recommended to use different icons for showing stakeholders and drawing lines and arrows for depicting flows along with some short text for more clarification (Meroni et al. 2011, 260).

Service blueprint

Service blueprint is a visual representation of detailing different aspects of a service, by integrating views of different stakeholders, such as service provider and customer (Van et al. 2011, 201). According to Meroni et al. (2011, 255), blueprints can be used for both, for designing new service concept as well as for analyzing existing service concepts. Visual representation helps in identifying required resources, processes and tools for the new service idea generation (Meroni et al. 2011, 255).

It is a great tool for establishing co-creation, as it builds collaboration between different stakeholders at the same time it brings awareness of everyone's responsibilities. Hence au-

thor also states that producing such document improves the co-operation and teamwork. (Van et al. 2011, 201- 202.)

Blueprints can be designed in a way that it represents entire process or it can be also designed with narrowed focus on some specific encounter or process (Meroni et al. 2011, 255). According to Van et al. (2011, 202), draft blueprint should be created in the very beginning of the service design process to analyze different aspects of services. When the ideation and conceptualization of new service is generated the document can be further elaborated with detail information at implementation stage and used as a roadmap for service delivery (Van et al. 2011, 201- 202).

Implementation

Implementation of new service concept by default calls for a process of a change and as very well explained by author change management is an art in itself (Stickdorn 2013, 126).
There are many elements which might go wrong while provisioning actual service hence it is important that management is convinced of the service concept, support, identify and solve problems quickly. This is why it is very important to also loop in employees from the beginning of service design process and have a clear vision of the concept.
The change implementation is followed by an evaluation of the progress. These iterations thus encapsulate the idea of the "iterative process" of design thinking. (Stickdorn 2013, 126-127.)

5 Results of SD process

As highlighted by author Bettencourt (2010), it is important to finalize focus of the service innovation to be able to do successful implementation. Considering this in mind, thesis research questions were defined in the beginning and focus was to improve existing change release process by adopting new innovative ways of working and software development methodologies. Following chapter explains how the service design process was conducted using different tools and methods, workshop and interviews along with the final results.

This thesis carries out exploration, creation and reflection stages whereas the Implementation phase is out of scope. While applying service design process, the basis of theoretical framework is also taken into consideration.

5.1 Exploring the case

As stated by Vargo and Lusch(2008, 7) in the foundational premises of S-D logic, services are intangible and defined as the basis for all exchange, where value is allways uniquely determined by it's beneficary. This is why it is very essential to understand needs and expectation by it's beneficiary to provide most unique value.

In order to develop a successful service strategy, author Bettencourt (2010) defines the four step service innovation process. The second step of the process is "uncover customer needs", it focuses on gaining the customer insights and understanding their needs. (Bettencourt 2010, 17-19.)

Hence after finalizing the scope and research questions for the thesis, it was time to start the journey with exploration stage of the process and seek answers for research questions.
As stated by Stickdorn (2013, 120), the first task of a service designer is to understand the company culture, its goals and analyzing its readiness for change. Keeping this in mind a desk research activity was undertaken to gather information that already exists and analyze current ways of working.

5.1.1 Desk research

To begin with desk research, information about the current change release process that is based on waterfall methodology was captured. Change release process was carried out in linear fashion from requirement collection to design, development, and testing and implementation phases. Several documents about the current process were available on company intranet pages, such as change release process description, release and deployment process flow, user acceptance testing and go-live criteria for delivery to production, control check points along with different release schedules and planning.

To get complete overview of the process, its stakeholders and the activities performed within the process, a system map was generated as shown in below figure 9. As stated by author Meroni et al. (2011, 259) , system map helps gain a better understanding of end to end process and analyzing key interactions between different stakeholders. Short text helps build a detailed understanding behind each and every step, making it crystal clear. System map was later reviewed with change release manager to make sure that there were no gaps in understanding.

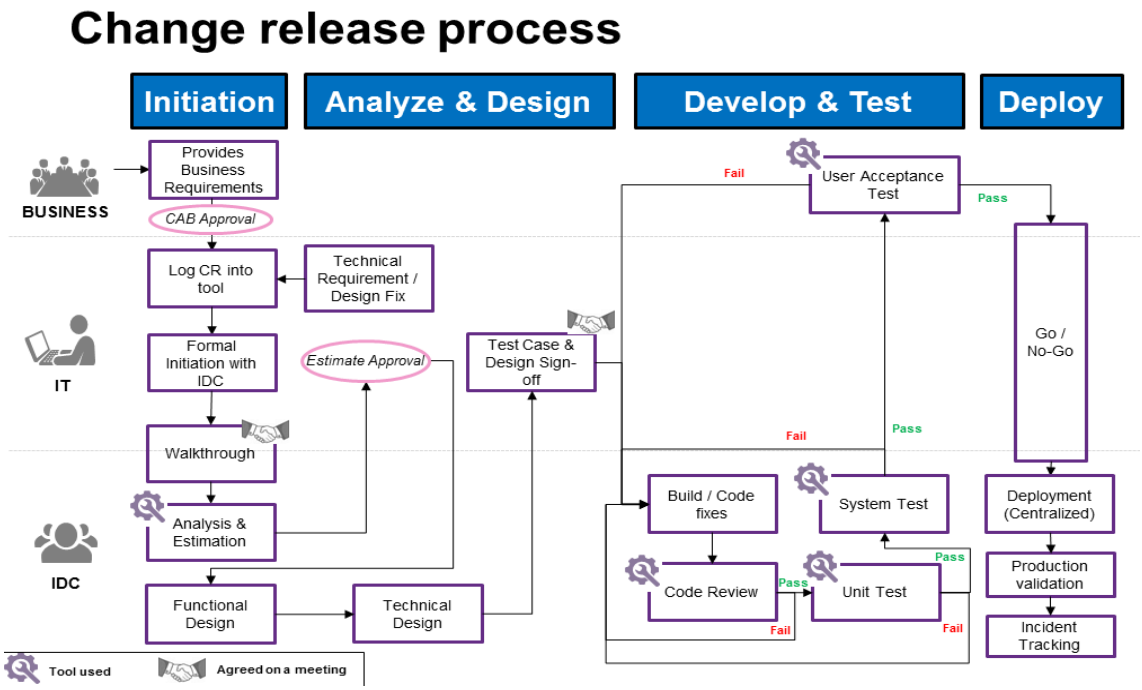

Figure 9 : System map of unit Y's change release process as presented in case company X's intranet.

While browsing through the intranet pages of company X, for current ways of working with different processes, it was found that some of the units within company had already adopted agile ways of working. From the point of view of this thesis, it was quite interesting to analyze and understand agile practices that had already been adopted by these units, tools and method they are using and their learnings from agile implementation. Several documents and valuable information was retrieved from company's internal portal describing their agile development work.

5.1.2 Interview

As very well stated by author Kumar (2012, 87-88), a design which is based on people's needs and behavior will be a good design, hence it is important to listen to their needs and thoughts, understand their feelings as well as observe and analyze them. This way, one would be able to design a great service by gaining highly valuable insights.

This section covers interviews conducted with different stakeholders. Ethnographic interview was conducted with one of the financial area key user, who was also an internal customer. The subject matter expert interview was conducted with change release manager and with a service manager from unit Z who had already adopted agile ways of working. This was done in order to gain detailed understanding from the expert's themselves.

Ethnographic Interview

Focus for ethnographic interview was to identify challenges and pain areas in the process from the end user's point of view. As recommended by Kumar (2012, 111), face to face interview was arranged and was conducted in a very casual manner instead of using scripted questions. Interview was scheduled for an hour and agenda for the interview was clearly mentioned in the invitation. With user's consent, interview was recorded on phone and it was agreed that the users name will not be disclosed. In the first part of interview, user was requested to explain the current release process from his point of view and his role in the process. According to the user, he was happy with current way of planning and the kick-off sessions of the release that give him accurate information about the time plan. As a user he is involved in requirement gathering, partly in designing and then later in testing phase of the process. The user also mentioned that testing process is a bit stressful. It was also mentioned, that many a times there isn't enough time for user acceptance testing. In addition to that, problems are often found with test system data and performance. According to the user "less time and quality data issues in test environments lead to poor testing sometimes", which may cause concerns after moving these changes to production. On the contrary, according to the key user he is well acquainted with process, as he has been working in the organization for many years and feels that over a period, the process has built a good communication and collaboration.

Subject matter expert interview with change release manager:

Speaking with experts gives essential information about the topic, latest trends around it and can also provide guidance on where to look for details that one needs (Kumar, 2012, 83). Hence interview was arranged with release manager to get all the primary source of information. This was arranged as a telephonic call via Microsoft Lync communicator as he was located in Sweden and the call was recorded in Lync with his due consent.

Following are some of the key questions raised during the interview:

- Could you please walk me through end to end CR process?
- Where do you see the room for improvement in existing process and why?
- Have you heard about agile software development method and Scrum?

Release manager gave a detailed explanation about the entire process and clarified any existing doubts about different types of changes and the way that they were handled. During the call he also showed me the workroom page available on intranet where all the process relevant documents were stored. In response to the question about, "where according to him was

the need for improvement in the process?", his immediate response was "requirements". According to release manager in current scenario requirements are not handled in a structured way. Many a times requirements are received just before the requirement scope freeze deadline and also they are not detailed enough, which highlights the issue of requirement forecast. According to release manager "We need a requirement forecast and currently it is missing", which causes a huge concern for requirement prioritization. Which means that many times requirements are tagged to release process based on first come first serve basis and in some cases it has happened that high priority requirements came very late and had to wait for another three to four months so that they could be tagged to the next release. This lack of flexibility and long wait times, have caused anger and frustration at customer's end. In response to the question about any experiences with agile development or scrum methods, he replied that he has a high level of understanding but does not have any knowledge about how the scrum process works. He also showed some interest in receiving more information about this topic. This interview session was an eye opener to me as it revealed many facts which were not documented on paper or weren't part of the process.

Subject matter expert interview with service area lead of unit Z

As mentioned above, while conducting desk research it was accidently found that there were already some units within company x who have adopted agile ways of working. Purpose behind this interview was to gain an overall understanding on their agile ways of working, what type of method and tools they have been using and gaining insights on their experience with working agile. This was also a Lync interview call and it was recorded with due consent of the participant.

Interview began with introduction of interviewee and his roles and responsibilities in company x. After initial introduction, interview focused on understanding current agile team structure, methods and tools in use as well as contracts with outsourced parties. According to interviewee, outsourced parties already had experience working with agile; hence it was an easy transition. When asked about how they carried out the transition from traditional approach to agile ways of working, the expert elaborated upon his experience of working with the pilot project as follows.

According to expert interviewee, in the beginning several internal workshops were arranged to understand problems with existing solution and roles and responsibilities required for adopting new ways of working. After that, self-steering agile team of dedicated people assigned to work on building understanding of agile ways of working was set up. Internal training sessions were arranged for this and after many months of discussion, a pilot project was started, which was implemented gradually in the unit. It was also mentioned that currently it

is much like a hybrid process where release process is followed and the iteration is adopted at development and testing stage only by applying Scrum method. Contractual agreement with outsourced vendor was also discussed in the call.

During the discussion about benefits achieved by adopting agile ways of working interviewee mentioned that,

- "it helped in satisfying and building close cooperation with stakeholders",
- "it simplified our budget and decision making"
- "we are delivering continuously, with minimum bureaucracy"
- "and the best one is , we have empowered people by this change"

On asking the interviewee, if he or his team sees any challenges or disadvantages of working with agile, he responded that "working with agile means you have to continuously improve working with your operations, so you have to have managers or employees who come up with good suggestion to improve it continuously. I think I wouldn't look into problems or disadvantages because if you start from somewhere and improve all the time your work, it shouldn't be problem".

In the end as an interviewer, I asked him if he would like to make some suggestions or provide guidelines for me to begin this journey and the interviewee recommended that I should get a mentor to drive pilot project. All in all it was very well structured interview with some good insights and it provided guidelines for the continuation of thesis work. Interview question list is presented in Appendix 1.

5.1.3 Popular Media search

In order to answer thesis research questions related to waterfall and Agile, and to understand which of the two approaches is better and what methods need to be applied, a service design tool named popular media search was used. This method helps building broader understanding by analyzing what is published and broadcast in popular media (Kumar 2013, 24).

It was easy to find many blogs, scientific articles, research journals on the internet. Also many eBooks and articles were retrieved from Laurea's library and using online search tools. The starting point for media search was internet, to find out origins of agile and its definitions, which also lead to manifesto for Agile and its origins. Google scholar search itself ended with returning 275,000 results about agile development. As recommended by Kumar (2012, 63), a five step approach was used to conduct and analyses pros and cons of both agile and waterfall models. This allowed us to compare and validate which one was better and observations are documented in following chapters.

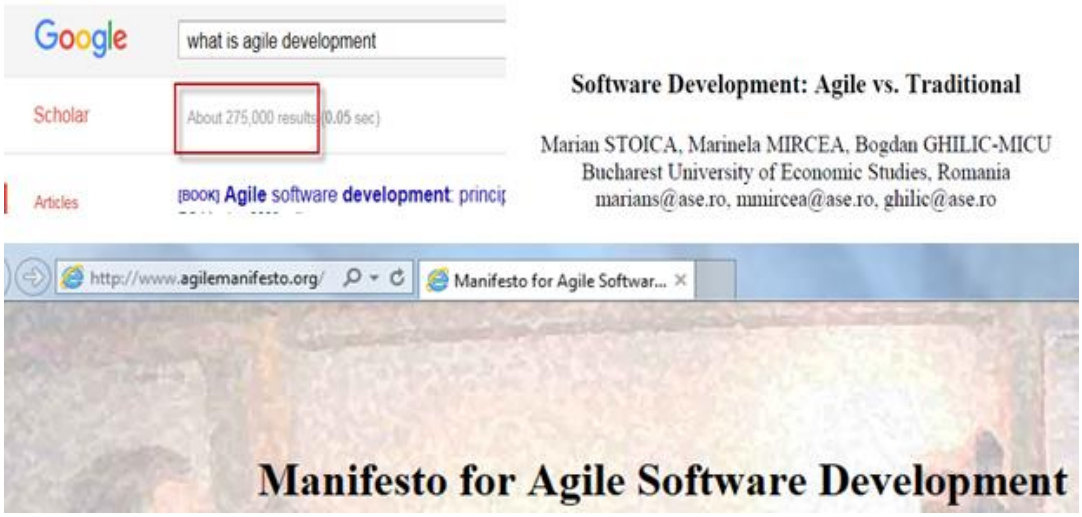

Figure 10 : Popular media search conducted online

5.1.4 Waterfall VS Agile

Input for below table 1 : Waterfall vs Agile, is collected from “Software Development : Agile vs. Traditional” article from author Stoica et al. (2013, 67-68).

Waterfall	Agile
Scope is clearly defined and fixed n the beginning	Allows adaptive planning and evolutionary development, hence good planning and design is required
Easy to use and understand	Planning can be sometimes uncertain due to changing requirements
Detail documentation on each phase, easy to follow for new members	Documentation is done as per the need and requirement
Linear sequence, only one stage implementation at a time	Each stage itself is in ready development state, which meets the client requirements
Rigid and inflexible. Changing requirements are difficult to handle	Allows change in requirements rapidly and effectively, with lower cost
Testing and Feedback gathering introduced late in the process	Each iteration itself is in development ready state. Excellent option for experimental software design
Any new changes would require additional time, efforts and budget (depending on case)	Prototypes are delivered and client feedback is collected simultaneously with iterative development, while this approach could lead to "code and repair"
Recommended for small projects with fixed requirements	Recommended for cases where major requirements are clear with some small changes in place

Table 2: Waterfall vs Agile (Stoica et al. 2013, 67-68)

According to Stoica et al. (2013, 66), it really doesn't matter if it's a traditional waterfall model or Agile model, as each model has its own advantages and disadvantages and organization should select model that best suits its needs. Taking this into consideration, it is also concluded that any software development application involves complex processes which requires testing and validation. Hence it is highly recommended to test and validate solutions before taking it into production and making sure that project requirements are implemented according to the specifications. (Stoica et al. 2013, 74.)

Based on my research, at least I personally couldn't find any such article which clearly puts agile software development methods above waterfall method or vice versa. Many studies state that, depending on an organizational culture, people, processes and ways of working one should find out the most suitable approach for them. According to Boehm and Turner (2003, 32) neither agile nor plan driven methodology can be solely be considered as best, in

fact it is stated that future applications would require both discipline and agility in their way of working.

Boehm and Turner (2003, 39) strongly recommend carrying out a self-assessment for organizational readiness and suggest going for a balanced approach to take advantages of strengths of both waterfall and agile model while leaving out the weaknesses.

5.1.5 Popular Survey results

There are several survey results available online in the form of articles or journals. Though there are several scientific and non -scientific studies, blogs and research articles available online, their focus is mainly on presenting qualitative case study. While it is equally important to do quantitative research and understand the impact of adopting agile ways of working before and after. (Laanti et al. 201, 276.)

To understand the current worldwide scenario and future trends, survey results provide great insights and also provide some statistics. Here are some of the details presented in VersionOne (2015, 2-10) 9th annual state of Agile survey results. From this survey we can see that there are three key benefits of being Agile as well as several causes that can lead to projects failure. This type of survey results can be used by organizations right at the beginning to understand benefits and risks that needs to be covered.

Below figures 11 - 13 from survey showcases that, a survey was conducted worldwide in year 2014 and results were based on 21% participation from Europe and 65% from North America.

Figure 11: Respondent Demographics (VersionOne 2015, 4)

BENEFITS OF AGILE

There is plenty of evidence to conclude that agile works. For four years running, the top three benefits of agile development remain:

1. **Ability to manage changing priorities (87%)**
2. **Team productivity (84%)**
3. **Project visibility (82%)**

Furthermore, **53%** of respondents said that the majority, if not all, of their agile projects have been successful.

When asked what causes agile to fail, respondents pointed to lack of experience with agile methods (**44%**).

Figure 12: Benefits of agile (VersionOne 2015, 2)

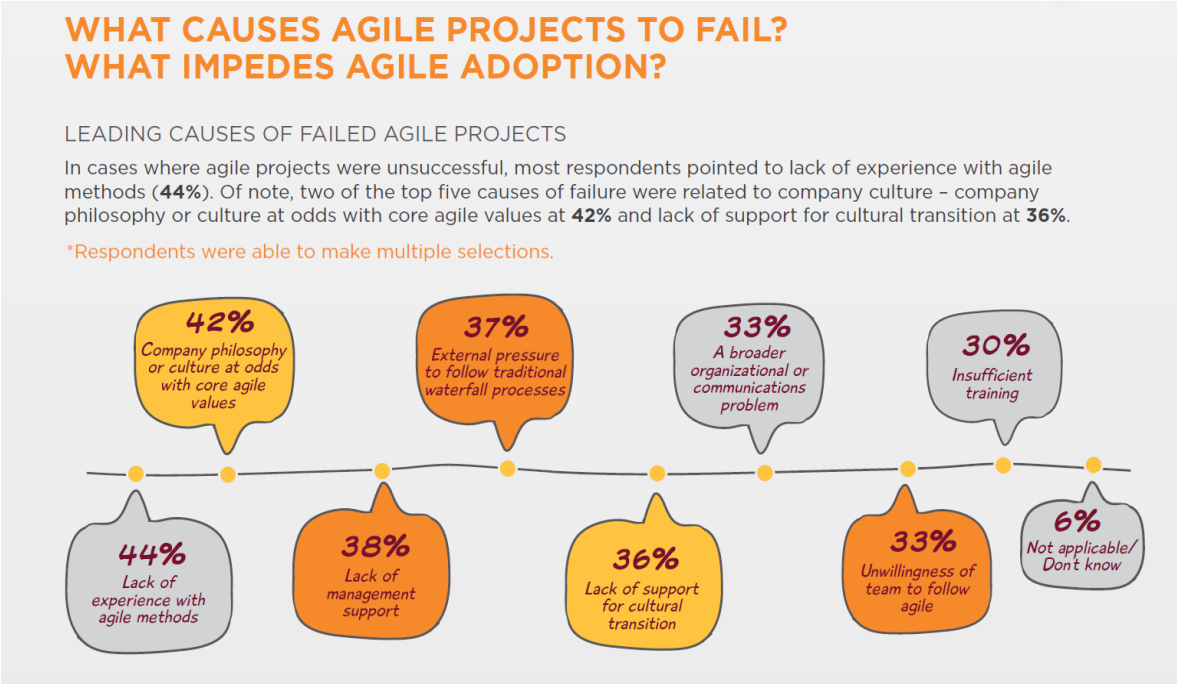

Figure 13 : Leading causes of failed agile projects (VersionOne 2015, 10)

5.1.6 Stakeholder Map

As mentioned in Table 1, service-dominant logic foundational premises, value is allways uniquely determined by it's beneficiary and also as per FP9 "all social and economic actors are resource integrators" (Vargo & Lusch 2008, 7).

Looking at the foundational premises and theory of value co-creation presented by Prahalad and Ramaswamy (2004), it is evident that involving all relevant employees, stakeholders and customers in to a workshop could provide better visibility for value creation. Keeping this most valuable therotical background in mind, the process of identifying relevant stakeholders for co-creation workshop was carried out.

Figure 14 below shows the stakeholder map generated for unit Y, to figure out required stakeholders for the co-creation workshop and template is downloaded from Smaply's web-site. Visual presentation of stakeholder map also helps in building understanding about the relationship between different stakeholders.

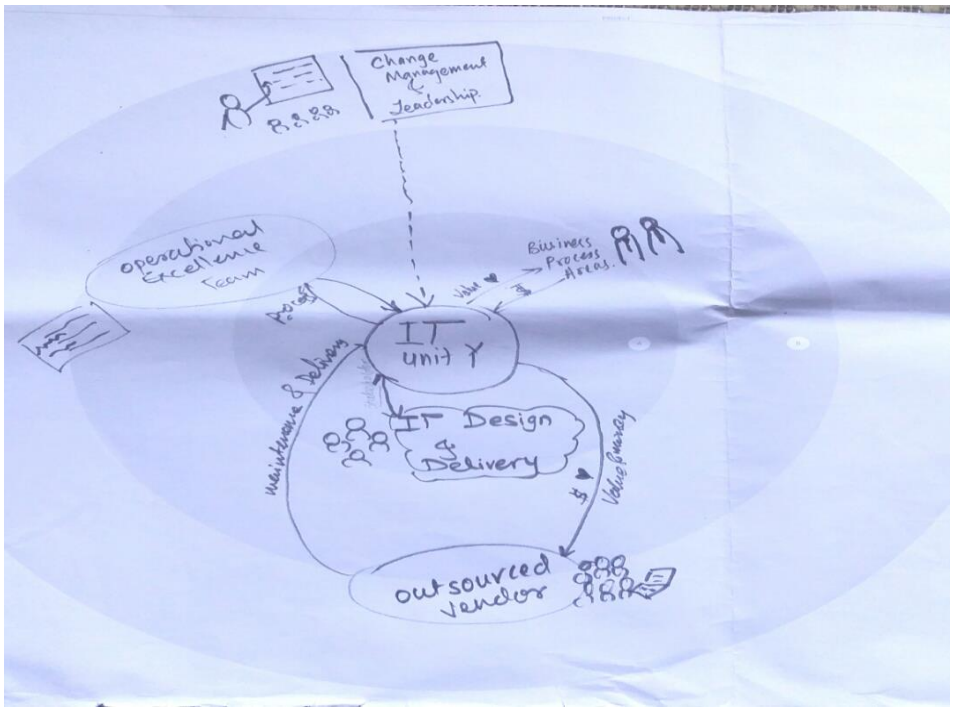

Figure 14: Stakeholder map for unit Y (Source : smaply, 2015)

Identified stakeholders from the thesis research perspective are IT design and delivery managers from service teams, customers from different process areas, release process manager from operational and excellence team, outsourced vendor and change management leadership. Though outsourced vendors are identified as important stakeholder, they were not involved in workshop as face to face participation was required to use some service design tools and methods and as mentioned earlier this team is located in India.

5.2 Creating the solution and testing

After building enough understanding and gaining insights on current ways of working, its challenges and agile ways of working, it is time to move further with creation stage of the process. As mentioned by author Stickdorn (2013, 122) this is generative and proceeding stage of the reflection, where most of the iterations takes place. Idea is to explore concepts, test them and identify mistakes as early as possible, by involving all relevant stakeholders from the beginning (Stickdorn 2013, 122).

5.2.1 Workshop results

As suggested by authors Prahalad and Ramaswamy (2004, 7), value needs to be jointly created by both the customer and the firm, such high quality interactions among customer and company will allow co-creating unique experiences.

Popular media search and desk research conducted in earlier phases and as explained in section 5.1.3 and 5.1.1 respectively, helped further in deciding focus of the thesis workshop as well as tools and methods underpinning it. As Moritz (2005, 19) defines a service design workshop helps in gaining insights on customer needs and building the development ideas collectively using different service design tools and methods. It is also learned earlier in the process that for a successful service innovation it is important to uncover customer's unmet needs and prioritize the most essential ones. One of the best practices of doing this is by involving the customer in the process from very beginning. Hence purpose was to arrange a co-creation workshop to identify challenges in current process from customer's point of view and understanding the expectation for desired service.

In order to gain customer insights on the current change release process, a workshop was arranged with different stakeholders. While the workshop was scheduled, agenda was clearly mentioned in the invitation which was that inputs are required on the existing change release process, understanding challenges in the process and improvements required. Stakeholders involved in this workshop were IT service design manager of unit Y, change release process manager and two internal customers who were key users from Finance and HR department.

Since the workshop was meant to be face to face and most workshop participants were located in Sweden, a one day workshop was arranged in Stockholm, Sweden. This made it feasible for all the participants to attend the workshop. Workshop agenda is attached in Appendix 2.

Tools used during workshop were, customer journey map, brainstorming and SWOT analysis. Following chapter elaborates upon, how different tools were used in the workshop.

5.2.2 Customer Journey mapping

Customer journey map was used as a tool in a the workshop to understand the change release process from the customer's point of view as well as to understand customer's experiences in the entire end to end process. Different stakeholders are playing different roles in the change release process, like business owner is responsible for providing business requirements, IT design manager is responsible for collecting business requirements and documenting it as CR, key users are responsible for testing the solution in need and verifying the outcome, while release manager is responsible for keeping track of entire process, following it up and measuring the success factors. Hence it was essential to map each stakeholder to the phase of the

process that he or she is involved in and understand the different touch points, perceptions and experiences throughout the process.

Stickdorn's customer journey map template was used for the workshop. It was printed and handed over to each participant and they were requested to fill it. After an Initial introduction about the tool, instructions on how to use tool and purpose behind using it was briefed to everyone. Only process release manager did not participate as he needed to rush for an urgent one hour meeting. However results were presented to him when he joined back so that he stays on the same page.

As mentioned earlier, change release process is based on waterfall model which follows linear approach from requirement collection to design, development, testing and implementation phases and different stakeholders play roles in different phases of the process. So in the beginning, it was a bit confusing for everyone to understand from where to begin, should he /she be explaining the entire process or only the phases where they are participating in. To clear the air I explained to participants the purpose of using this is tool is to understand customer's journey through their own voice. And there for the starting point should be the beginning of individual's journey in the process. This means that it could also start from initial release communication and kick-off sessions. After this explanation the usage of the tool was quite clear to everyone and they started describing their own journey.

As per the feedback received, it was quite interesting and enjoyable way of putting down your own experiences and emotions in the journey on paper. Everyone liked the tool and especially enjoyed describing their emotional journey part. IT designer manager commented that "visual representation of emotions quickly provides insights on key pain points in the process". Release process manager also highlighted that he sends out a small feedback questionnaire after every release to gain customer feedback but the result is based on a set of questions that are asked and according to him this tool is an eye opener because it provides real insights on service experience at each touch point which may not be covered in questionnaire that he uses.

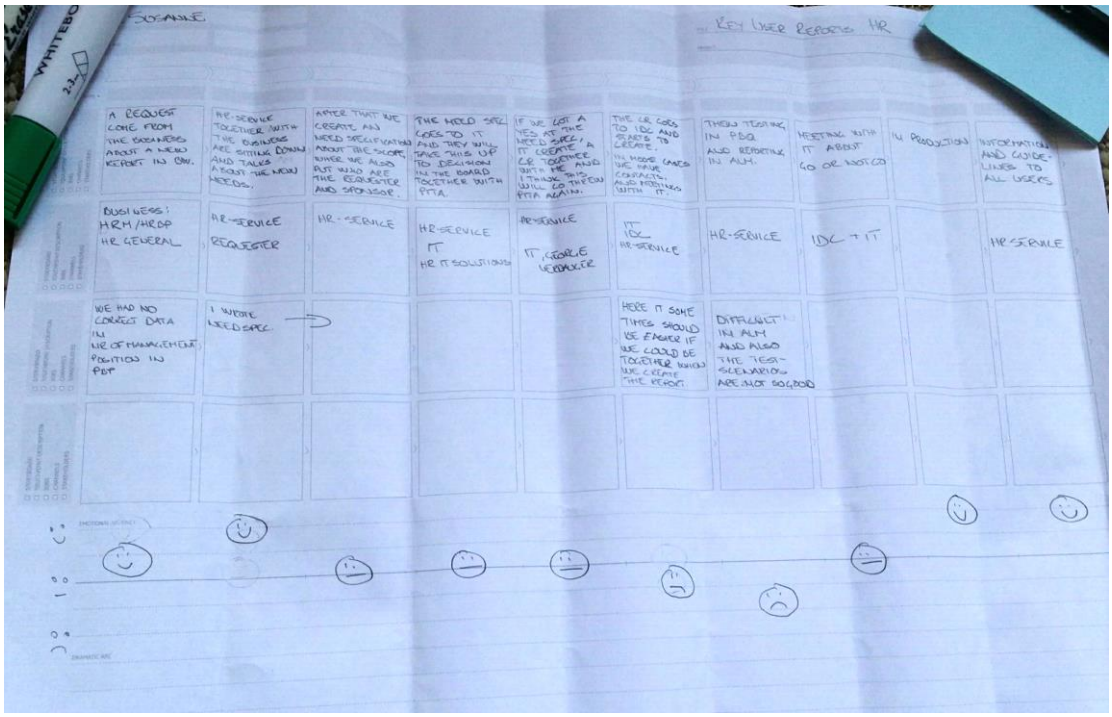

Figure 15 : Customer journey map from workshop

5.2.3 Mind map

As seen in section 4.4.2 it is recommended to use mind map tool for a group work activity as it allows everyone to start thinking and putting up their ideas about the central concept freely without any hesitation. Service designer should initiate such activity and invite relevant stakeholders such as service providers, employees or customer, to brainstorm and further develop a mind map. It is one of the most effective methods to generate large number of ideas in quick and effective manner. (Moritz 2005, 210.)

Hence after noticing that all the participants in the workshop had opened up and had also thoroughly enjoyed using the customer journey map, it was the right time to start brainstorming and drawing the mind map of the change release process. This was done in order to collect key topics around the process and to start group discussion over opportunities and areas of improvements. The picture below is from workshop and it represents the topics that were discussed.

For this activity we used a white board and I handed over colored markers to everyone so that we can later identify and analyze reflections by different stakeholders. During this group activity it was noticed that some of the participants were reluctant to get up and start drawing their ideas, they rather preferred to remain in their own sit and propose ideas. Once I noticed this I allowed some more time for open discussion and after initial brainstorming, I started

putting ideas on board by asking other participants to come forward and help me further to develop the ideas in their own words. This is shown in figure 13.

This activity allowed us to broaden our perspective and have a 360 degree view of the change management process. Several issues were discussed in detail, this was along with idea generation about how it could be improved and understanding what the expectations from customers are and what are the obstacles to change it. Results or outcome created by drawing mind map is then later used in SWOT analysis to document it in structured way. Figure 13, presents Mind map and the text written in red is by me while the text in blue are the contributions to the discussion by finance internal customer. Although the text on board is written by two of us, it includes ideas proposed by all participants and the discussion we had together.

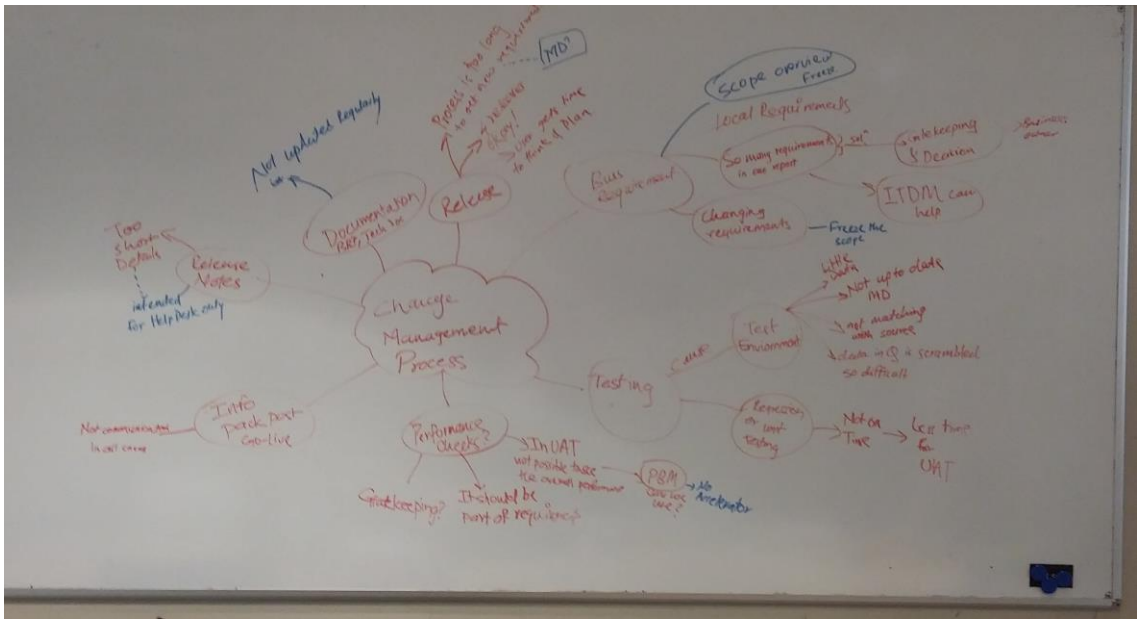

Figure 16 : Mind map from workshop

5.2.4 SWOT analysis

After the initial brainstorming session on change release process and creating mind map, we were able to generate many ideas over current ways of working and on how they could be improved further. Also considering the valuable suggestion from Prahalad & Ramaswamy (2004) DART model, it is necessary to conduct risk assessment. Therefor in the latter half of the workshop we decided to put all the collected ideas into SWOT analysis format. SWOT analysis helped us in analyzing strengths, weaknesses, opportunities and risks in the process.

Two types of SWOT analysis were carried out for this thesis work. One SWOT analysis was based on Unit Y's current ways of working with change release process and the other one was for considering a scenario of moving towards agile ways of working.

Figure 17 : SWOT analysis from workshop

The table 3 below represents the ideas that were collected from mind map session and were further framed into SWOT structure.

SWOT analysis for change release process

Strengths	Weaknesses
- Well controlled process - Good planning and scheduling of business releases - Good communication flow between all stakeholders - Everything is documented	- Too short time for UAT - Requirement forecast is missing - Need of process for small changes - Too long time to take small changes to production - Changing business requirements - Test systems are very slow - Strict adherence to release process

	- Documents are not updated in detail, also blueprints are not updated - Gatekeeping not done for performance checks - Test system master data not in sync with production gives sometimes wrong results
Opportunities - Good way of business requirement gathering - Defining test scenarios in requirement itself, so that requirements are clear completely	Threats - Projects need to be in sync with minor developments - Prioritization of changes is difficult to no proper/agreed way of working with prioritization New CAB structure: - Information sharing is missing - Impact analysis or risk analysis not carried out to the core

Table 3 : SWOT analysis for change release management process

Table 4 below represents SWOT analysis carried out for adopting agile ways of working for unit Y. SWOT analysis over agile ways of working was not part of the workshop, as not all the participants were aware of agile software development methodology. There was an introductory 2 day training session arranged by release management team for the entire IT unit which covered introduced agile software development methodology. This was done in order to introduce everyone to agile and related terminologies. As a part of the training the instructor asked everyone to create SWOT analysis as a group activity. So table 3 is the outcome of this training workshop where I also participated along with service managers from different areas along with IT design manager and release process manager. Since outcome of this SWOT reflects very good points about the adoption of agile ways of working, its results are used in this thesis for further study and comparison purpose.

SWOT analysis for adopting agile ways of working

Strengths	Weaknesses
-Welcome changing business requirements	- Management not ready to delegate

- reduce risk of rework and last minute delays - Unit Y has motivated people who are willing to learn and adapt Agile ways of working -Jira tool already available to align Agile ways of working	authorities - Strong culture of avoiding mistakes rather than taking risks - Unavailability of key resources and competences
Opportunities - Wider footprints of Unit Y as a service provider within company	Threats - Needs cross area knowledge in maintenance teams - Training requirements - Changing people mindset and ways of working - Teams working and supporting globally

Table 4 : SWOT analysis for adopting agile ways of working

After analyzing and comparing results of SWOT analysis from table 3 and table 4, it is quite evident that there are many weaknesses identified in current change release management process. Some of the weaknesses which are marked in brown color in table 3 are identified as strengths which are marked in green in table 4.

The third step of innovation approach defines that customer needs which are highly important but not satisfied well makes it a good candidate for service innovation opportunity. Author suggests that if there are many identified needs then it is important to prioritize the most important ones. (Bettencourt 2010, 22).
Comparison of results from SWOT analysis, uncovers customer's needs and also make visible the most important priorities such allowing flexibility in accepting change in requirements, while also delivering faster results for small changes.

5.2.5 Agile development readiness assessment

Shiri et al. (2015, 56) suggested that, in order to survive in the current constantly changing environment, organization needs to be agile to be able to carry out required changes quickly and efficiently. Hence it seems to be important to conduct organizational readiness assess-

ment to analyze its strengths and weaknesses (Shiri et al. 2015, 56). Pre-assessment may also help in identifying factors that can prevent successful adoption of agile, which could be further worked on to eliminate these factors completely (Sidky 2007, 28).

It is also recommended by author Cooke (2012, 75) even though it sounds very interesting and beneficial to implement agile methodologies, organizations should take a step back and conduct a necessary check to identify how suitable the agile methodology is for them.

As explained earlier in detail, based on the six critical criteria questions provided by Cooke (2012) assessment was carried out for unit Y by me and results are presented in table 5. Next step was to present it further to stakeholders and gather feedback to ensure that we have a common understanding. These results were later presented to IT design manager of unit Y and release process manager separately. We went through a list of criteria and questions one by one and validated the analysis that I have presented in table 5. Almost all the answers matched and we concluded together that unit Y is ready to adopt agile ways of working without any major challenges.

Criteria	Analysis	Ready to adopt Agile model	Not ready
Quality	In some cases partially meets quality as change in requirement is not accepted	✓	
Timeframe	Yes, most of CR's are delivered in agreed timeframe and budget	✓	
Requirements	Unit Y often receives change in requirements	✓	
Company culture	Culture is changing and Unit Y has motivated staff	✓	
Management Support	Yes, management is supporting but delegation of authority needs to be done	✓	
Dedicated resources	Yes, this can be achieved	✓	
Competencies to work Agile	Currently not, with training in place can be done	✓	

Table 5: Readiness assessment for adopting agile model (Cooke 2012, 75-83)

5.2.6 Agile team: Role mapping

Keeping in mind that unit Y is ready to adopt agile practices; next step in the process was to determine best suitable method to work agile which is also the second research question of the thesis. Based on the detailed analysis, it is recommended to use Scrum methodology for unit Y. Section 3.4 of the thesis presents the detailed analysis over Scrum usage, what type of roles and responsibilities there are and overall working of the process. Company X has already acquired a tool named Jira which supports agile ways of working using scrum framework. It provides the required flexibility to work agile in systematic manner. Also the benefits of using Scrum are in line with IT strategy of unit Y and therefore it makes Scrum the perfect solution for unit Y.

Keeping this in mind an initial analysis on required role changes was carried out. Table 6 represents scrum roles required to work Agile, which are further mapped with unit Y's current organizational structure. Mapping roles reflect that without putting major efforts in changing the organizational structure, Scrum process can be adopted easily and this is an added advantage.

Last row of table 6, which is a tester role is greyed out on purpose as it will be removed. Below role mapping results were reviewed with change release manager and he mentioned that Scrum supports agile iterative methodology where testing and feedback is part of each sprint and should be done continuously by development team along with product owner and customer. Hence there is no need for additional tester role, which I completely agree with and after discussion excluded tester row from the table.

Scrum Roles	Current roles	Comments
Product Owner (PO)	IT Design manager	Collects requirements
Scrum Master	IDC Team lead	Co-ordinator between PO and development team
Development Team	IDC BI, ABAP, Functional , testers	Team members are selected as per the requirement and expertise required
Tester	IDC development team, Internal customers/ end users	Product owner approves

Table 6: Scrum Team (role mapping for unit Y)

5.3 Reflection: Prototyping solution and reviewing

As recommended by Stickdorn (2013, 124-125) , After ideation and creation phase of the iterative process, it is time to prototype the solution and review it with management team so that feedback can be collected as early as possible and can be developed further. Since services are intangible Stickdorn(2013) suggest to visualize solution and prototype it using variety of tools and methods. Considering these suggestions a service blueprint tool is used to visualize scrum development process for unit Y.

5.3.1 Service blueprint: Scrum development process

Section 3.5 explains theoretical detail of the overall Scrum development process whereas here, the concept is further elaborated at a practical level and way it should work for unit Y. Figure 16 below represents how the process should work in an iterative manner. It is adapted from Boehm and Turner (2005) and service blueprint copy is attached to the thesis as Appendix 3.

According to suggestions, product owner should collect all requirements from internal customers, team members or other stakeholders and prepare a product backlog. Once product backlog is ready a sprint planning meeting is arranged by product owner with scrum team, which means including development team, scrum master and if needed, customers. Purpose of sprint planning meeting is to go through user stories and prioritize them and finally produce a sprint backlog. (Moreira 2013, 51.)

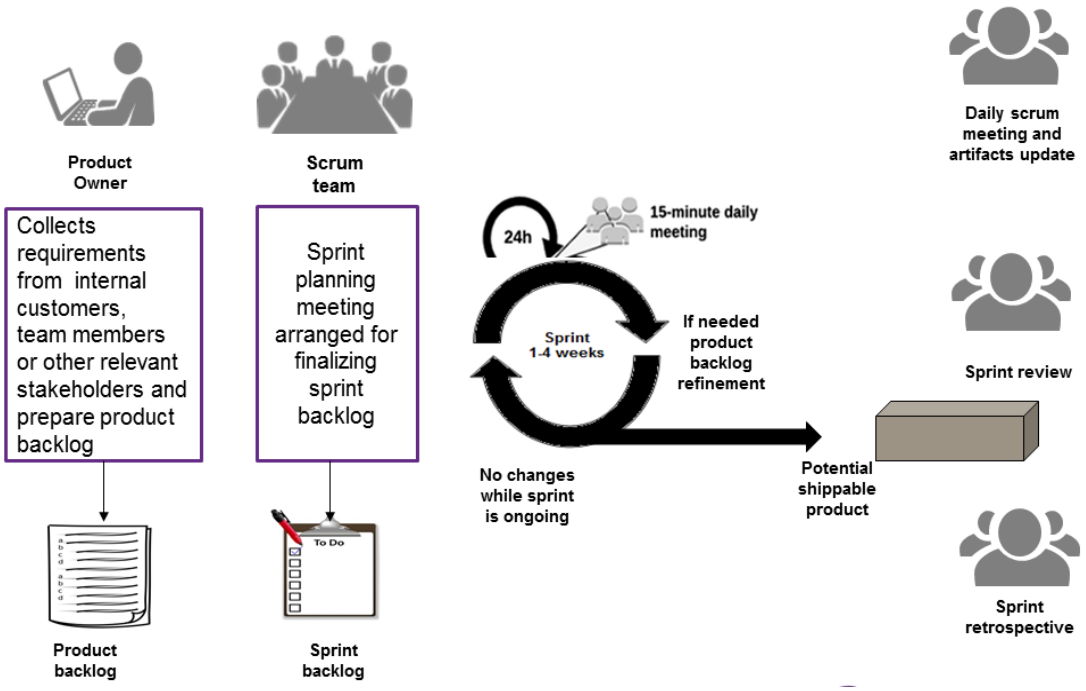

Figure 18 : Scrum development process (adapted from: Boehm and Turner (2005))

During sprint, scrum master should hold daily 15minutes stand up meeting to make sure that sprint is in progress and also acts as coach for the team. Once sprint is ready, working software is tested with customer and product owner so that further feedback can be collected. (Moreira 2013, 52.)

Last step is sprint retrospective, where entire scrum team should go through learnings from that particular sprint to review what went well and what needs to be improved further (Moreira 2013, 52).

Scrum development process has been reviewed with change release manager, IT design and service delivery managers for getting more feedback, but there were no big changes or comments in return as everyone agreed that this process looks fine and quite understandable.

5.3.2 Implementation guide for moving towards agile

Coming back to the third research question about what actions should be taken to start working agile, an agile implementation framework is created which outlines actions needed further by management team of unit Y. There are a variety of agile adoption frameworks available in the market which can be used by organizations to start journey with agile practices,

while stating that purpose here is to present overall view on different steps needed to perform in order to reach the target.

As shown in Table 1, in which Vargo and Lusch (2008, 7) present foundational premise FP10, which explains that value is uniquely determined by it's beneficiary, hence it was decided to create value by collaboration with service management team. Co-creation approach was used while creating this implementation guide, including the service manager and IT service design manager.

Individual meeting was arranged with each participant due to time conflicts and overlapping schedules for three of us. The initial draft framework was created by me and presented towards the service manager and IT service design manager to test the prototype and gather feedback. Set the objective step from below figure 19 was not present in the initial draft and it was added after service manager highlighted the importance of including it in the process. Service manager pointed out that it is most important to set clear objective in the beginning and stick to it till the implementation is done. According to service manager without clear objectives project might even lose its focus and hence it is important to document this step in the implementation guide.

After receiving this feedback "set the objective" step was added as shown in figure 19. There were no improvement comments provided by IT design manager. After all changes the implementation framework was shared with both of them again for further feedback and after final input results are as shown in figure 19 below.

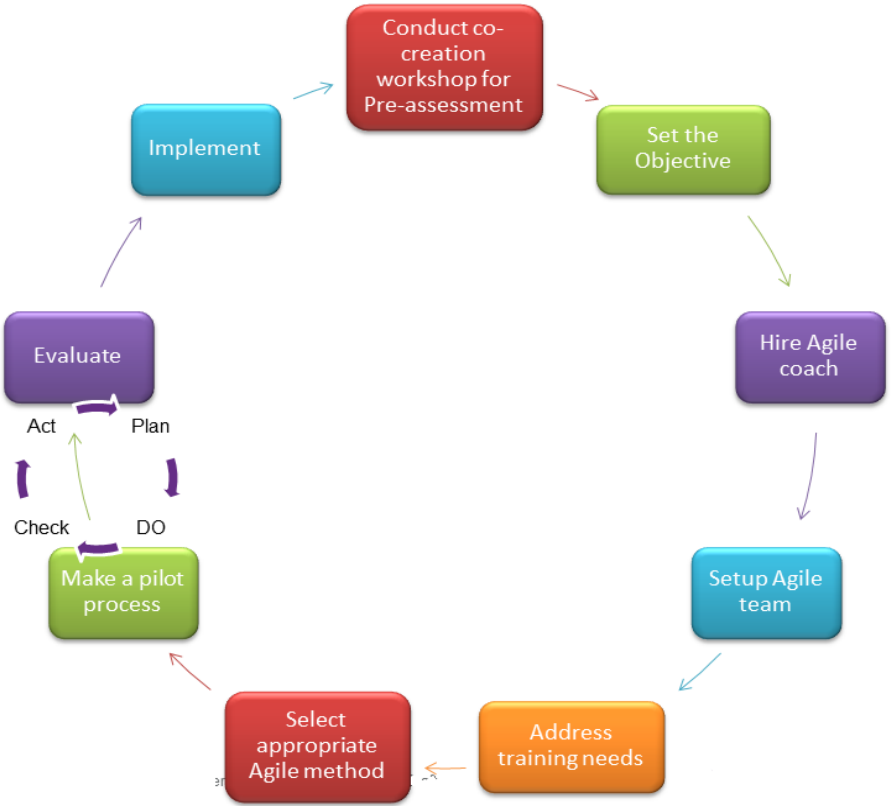

Figure 19 : Implementation guide for moving towards agile

Conduct Co-creation workshop for agile adoption readiness assessment:

As explained earlier in section 5.2.5, Agile development readiness assessment, it is very important to conduct pre-assessment before adopting agile methodology in practice, there for the first and most important step of the framework is to conduct a co-creation workshop with relevant stakeholders in order to assess readiness for Agile. After initial assessment if results are positive then next step is to finalize scope, set objectives and hire an agile coach.

Agile coach

Sidky (2007) states that agile adoption framework is one essential part of the process while the other is agile coach, who understands how to apply that framework and knows how to facilitate the end to end process. An agile coach can be a consultant, hired from outside or he\she could also be internal employee with required training in agile method and facilitation. (Sidky 2007, 12.)

Under the guidance of agile coach next actions should be setting up the agile team and addressing training needs for team members. Once training is completed agile team together with the facilitation of coach should be able to decide which method better suits to their

needs and fulfills customer value. After finalizing the method that everyone has agreed to follow, it is time to create a pilot process and evaluate results. These steps should reiterate as long as suitable agile software development process is found. After finalizing the process it is time to implement it. It is also mentioned by Sidky (2007), that it is possible that an agile coach can change or modify adoption framework based on his\her knowledge and experience as well as understanding rganisations needs.

6 Conclusion

This thesis was conducted with a clear objective in mind and research questions were set in the beginning. For unit Y as an IT service provider, the aim was to improve an existing service provided to its internal customers, so that it enables them to do their core job in better and in an innovative way. Three research questions were set out in the beginning and focus of the research activity was to find suitable answers which would help management team of unit Y to make decisions based on those answers. Based on the facts that there are challenges in existing change release process and increase in demand for need of flexible and faster process from customers, management team wanted to understand and know more about agile practices. They wanted to understand its usage, if it is better than traditional waterfall model and which out of the several agile methods is most suitable in supporting the IT strategy. They were also looking for some guidance on implementation steps required to kick start the project.

After gaining understanding on needs and expectations of the customer, theoretical framework of service logic, Service- dominant logic and value co-creation and its application for service innovation is presented in the thesis. This thesis presents that co-creation approach for gaining customers and stakeholder's insights indeed is a best practice towards creating innovative service. Empirical part of this thesis also shows that the iterative process of service design along with different tools supports the theoretical framework of service-dominant logic and value co-creation. Visualization of desired solution outcome became possible by using service design methods. All in all, it can be concluded that service design is an excellent approach to work with all stakeholders and co-create values.

To be able to answer the first research question, "Which one is better, waterfall model or agile model?" an extensive research was carried out by considering foundational premises of S-D logic and by applying value co-creation approach . Based on the findings, it can be said that there is no better or worst model. Personally I couldn't find any article which proves that the waterfall model is better than agile or vice versa, both models have their own advantages and disadvantages and any organization should do a complete assessment before adopting any of the two models. This was in order to analyze organization's readiness towards change.

Hence this thesis provides list of agile development readiness criteria that should be checked first, in order to understand the organization's needs and its readiness for adopting agile practices. Readiness assessment was conducted for unit Y and after reviewing results with stakeholders and getting feedback, it can be said that unit Y is ready for adopting agile practices. After confirming unit Y's readiness towards agile practices, next step was to find out best suitable method. Based on the learnings from co-creation approach, it is highly recommended to carry out assessment in a co-creation workshop

Service innovation approach along with service design methods, further helped in identifying the best suitable agile software development methodology, which in this case is Scrum. Popular media search and subject matter expert interviews revealed that Scrum development process supports iterative framework of agile methodology along with flexible and disciplined process to follow. Benefits of Scrum support, expectations and requirements set by customers towards unit Y by supporting its IT strategy as well. Scrum method supports working with globally distributed teams which is the key element of unit Y, as teams are located globally. After conducting the subject matter expert interview with service area lead of unit Z, it was clear that Scrum has been used successfully within some of the units of company X. This usage is currently supported by Jira tool. This also means that unit Y doesn't need to bear additional licensing cost for tool as Jira is already available and can be used further. Based on these findings, recommendation is to go for Scrum method, where thesis also provides role mapping required as per the Scrum framework and it reflects that no major organization level changes were required for adopting this method.

Looking at the last research question "What can be done to start working agile?" a service blueprint reflecting the scrum development process in case of unit Y is represented in the thesis. It gives visual presentation of how a change request will be handled using Scrum process and makes it clearer and meaningful for stakeholders and management team of unit Y. Apart from this, an implementation guide for moving towards agile software development is provided. It reflects upon different steps required to start the journey of moving towards agile. Even while creating implementation guide, a value co-creation approach was used to gather input from stakeholders to improve the framework with continuous testing and feedback in place. Purpose behind each step is clearly mentioned and before presenting it to management team it was reiterated based on feedback from different stakeholders involved in the process.

Finally all results were presented to the management team and very positive feedback was received on the research activities performed. All research questions that were set together with management team in the beginning of thesis are answered. These also include direct insights from customers, making the customer expectation towards unit Y more specific and

concise. As per the feedback, management team really appreciated both SWOT analysis results and its own comparison, which makes the objective of moving towards agile clearer for them. The most motivating feedback came from my manager, who, as a result of this thesis felt that “this implementation guide for moving towards agile could also be beneficial for other units within company X, who are in the same situation and are considering adopting agile practices”.

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Figures

Tables

Appendixes

Appendix 1:

List of subject matter expert interview questions:

- What is your role and responsibility in the organization?
- How many people are working in your team and could you explain the area - what your unit is responsible for /what kind of day to day work carried out?
- Are you into development or maintenance or both?
- Since when you and your team has adopted agile practices?
- Which Agile method your team is using?
- Why have you decided to go for this particular agile method?
- How this method was taken in to use? Gradually or at once?
- What kind of meetings do you arrange? Daily, weekly etc.
- What advantages and disadvantages agile method brought along?
- How and where did you involve outsourced vendor in the entire process?
- How agile roll-out was carried out? What could have been done better in the roll-out? What is still to be done?
- Based on experience what are the benefits of moving towards agile for unit Z?
- What challenges unit Z is facing currently?
- Any suggestions/tips for me to proceed with this work?

Appendix 2

Co-creation workshop agenda

Agenda

- 09.30-10.30 : Study background, Thesis topic and plan
- 10.30 – 11.30 : Customer journey map
- 11.30 – 12.00 : Lunch break
- 12.15 – 13.15 : Mind map
- 13.15 – 14.15 : SWOT analysis
- 14.15 – 14.30 : Break
- 14.30 – 15.30 : Agile introduction

Appendix 3

Service blueprint for Scrum development process